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Washington Highlights

Legislation recently introduced in the Senate and House includes amendments to the Natural Gas Act, designed to interpret Federal Power Commission policy in a manner permitting the natural gas and oil industry to meet market demand for natural gas. The amendments also seek to make possible the general carrying out of the program recommended in the Natural Gas Industry Committee brief filled in the FPC natural gas investigation.

Identical bills to relieve problems of the gas industry have been introduced in the Senate by Senators E. H. Moore, Okla., and Homer Ferguson, Mich., and in the House, Ross Rizley, Okla., Henderson Carson, Ohio, and Clifford Davis, Tenn. All are members of the Republican party.

Authors of the measures introduced have explained that if eventually enacted a larger and more constant supply of natural gas is insured to consumer areas and moderating the problems of all branches of the natural gas industry, includinig production, gathering and distribution.

Washington officials of the Independent Natural Gas Association of America have contacted members throughout the country and urged their active support of the impending legislation effecting natural gas.

Restoration of the Government's power to seize strike-threatened vital industries is under consideration for possible legislation by Republican Senators Homer Ferguson, Mich., and H. Alexander Smith, N. J.

This would be a companion bill to their measure setting up a system of Federal Labor Courts, which they have ready for introduction.

President Truman relinquished his wartime plant seizure power last December 31 by proclaiming the end of hostilities.

The Justice Department has created a merger unit to ward off industrial combines, which, according to Attorney General Clark, threaten a "serious increase in the concentration of economic power."

Clark stated that the new unit has become a necessity due to the great increase in the number of business mergers.

He indicated that the unit would review mergers in the light of the the anti-trust laws and would "afford timely warning to members of the business community as to mergers which will result in illegal combinations."

The new unit will be part of the anti-trust division. Clark acknowledged that many mergers do not violate anti-trust laws.

"Corporate amalgamations," he asserted, " and acquisitions of competitors are in some cases a classic means of eliminating competition and are incubators for unlawful monopolies. If this trend is unchecked the small businesses of America may disappear from the sphere of effective competition."

Members of the nation's petroleum industry are displaying some interest in the bill introduced by Representative Hand, New Jersey Republican, authorizing the House Way and Means Committee to make a study of the relationship between Federal Government and the states in all fields, with special reference to the field of taxation.

The measure specifies that the study devote particular attention to the subject of apportioning of the tax dollar between the Federal Government and the states.

The Interior Department once more has refused to honor the famous old Valentine Land scrip as claims to potentially rich oil lands in Southern California.

Motions for oral arguments seeking to reopen claims in 1944 and 1946 were denied by Warner W. Gardiner, Assistant Secretary of the Interior. Despite the Interior Department's ruling, authorities are of the opinion that attempts to exchange scrip for California land will persist.

The Valentine action involves ground along the Long Beach and Newport Beach harbors and strips of ocean beach frontage at Los Angeles, Long Beach, Santa Monica, Huntington Beach, Seal Beach and Sunset Beach.

CONVENTION COMMITTEE

Front Row Seated Left to Right: H. C. Pyle, General Convention Vice-Chairman; C. R. McCollom, Reception; H. W. Hoots, General Convention Chairman; Mrs. C. M. Wagner, Chairman Ladies' Entertainment; E. B. Noble, Nat'l. President of A.A.P.G.; R. W. Clark, Technical Program; G. R. Bell, Publicity.

Back Row Standing Left to Right: J. C. Hazzard, Field Trips; H. J. Steiny, Transportation; C. H. Johnson, Arrangements S.E.G.; V. W. Vandiver, Hotels & Housing; W. P. Winham, Exhibits; E. R. Atwill, Entertainment; H. L. Driver, Program Chairman for S.E.P.M.; V. L. King, Registration.

A.A.P.G. Joint Annual Convention With S.E.P.M. and S.E.G. Draws Record Attendance

For the first time since 1937 The American Association of Petroleum Geologists held its annual meeting on the Pacific Coast March 24-27. The 32nd annual gathering at the Los Angeles Biltmore Hotel was distinguished by being held jointly with two affiliated and closely related societies engaged in the search for oil, the Society of Economic Paleontologists and Mineralogists, and the Society of Exploration Geophysicists. Delegates from all parts of the United States, as well as from Canada and South America attended the record-breaking meeting.

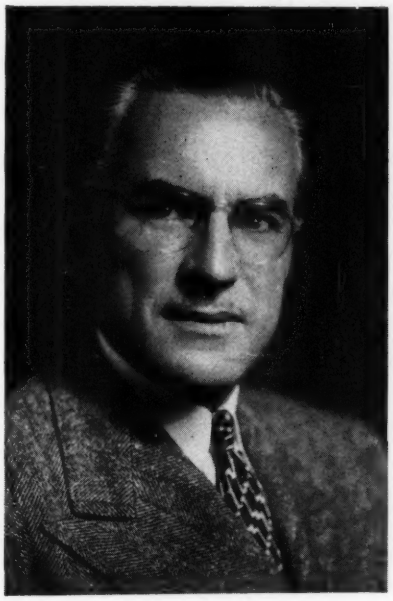
The convention opened with an address of welcome by Frank A. Morgan, Manager of Exploration, Richfield Oil Corporation. Responses were made by Earl B. Noble, National A.A.P.G. President; J. J. Jakosky, President, Society of Exploration Geophysicists; and F. W. Rolshausen, President, Society of Economic Paleontologists and Mineralogists. In a pre-convention statement, A.A.P.G. president Earl B. Noble said, "A meeting of this sort presents an opportunity for contacts and discussions between geologists, geophysicists and paleontologists from various parts of the country, and from different geological provinces. Many of the oil fields of the future will be found as a result of teamwork between these groups."

As an indication of the oil industry's interest in foreign exploration for oil, an entire day's session was devoted to discussions of the lands bordering the Pacific Ocean. Talks were given on Japan, Sumatra, South China, New Zealand, the Philippines, Alaska, British Columbia, Central America, Eastern Peru, Ecuador and Chile.

The technical sessions arranged by each of the three societies were replete with excellent papers, some of which were read and some of which were given in abstract. Overthrusting, a condition met frequently by geologists working in Pacific regions was a prominent topic at one of the sessions. Thrust faulting in Canada, Montana, Wyoming and California was also discussed.

Repetto Formation

In a presentation on the pseudo shoreline of the Repetto formation, Manley L. Natland, Richfield Oil Corp., stated that data from several lines of evidence indicate that the Repetto Formation was laid down in water at least 5,400 feet deep.



Frank A. Morgan (Welcomes Members)

Therefore, the buried and uneroded margin of this formation on the eastern side of the Los Angeles Basin does not represent the shoreline but some point far removed from it, the distance depending on the slope of the sea floor at that time. The information available suggests that an older eroded surface was lowered several thousand feet into the sea, about Upper Mohnian or early Delmontian time (Upper Miocene), and that the subsequent Repetto sediments filled in on contour around the old eroded surface, with no contemporary deposition on the sides of the basin. At Santa Fe Springs there is a complete Repetto section, but toward the southeast the lower beds progressively buttress out against the older complex, with the younger beds being the most extensive.

Reviewing the submarine geology off Southern California, Kenneth O. Emery, Univ. of Southern Calif., explained that the sea floor off Southern California consists of a checkerboard-like series of basins separated by submeged or partially submerged mountains. More than 6000 feet of relief is present. The basins and banks are bordered by straight steep slopes which have physiographic characteristics typical of fault scarps. Epicenters of many earthquakes fall on or near the scarps, thereby supporting the fault interpretation.

The basins between the banks and islands contain muddy sediments mostly derived from the land. The broad flat floors of the near-shore basins suggest that these have received greater quantities of sediment than the more irregular off-shore basins. During recent years many new instruments have been devised which greatly increase the accuracy and effectiveness of submarine geological studies. Prominent among these devices are underwater cameras, recording fathometers, and underway bottom sediment samplers.

California Sedimentation Patterns

Harold W. Hoots, Consulting Geologist, discussed the paleogeological setting for oil accumulation in California. He described known commercial accumulations of petroleum in California as restricted to beds of Tertiary age and, in a few local areas, to Cretaceous and fractured metamorphic rocks which immediately underlie the Tertiary. The paper also reviewed those events which have led to the development of favorable oil traps, and described the conditions and features which have influenced the stratigraphic distribution, geographic location and size of oil accumulations.

The origin and evolution of the Los Angeles Basin were reviewed by H. L. Drive Standard Oil Co. of Calif. The L. A. Basin, he explained,

Carroll E. Dobbin
President-elect of American Association of Petroleum Geologists 1947-48.

comprises an area of about 1,200 square miles. It is bounded on the north by mountains uplifted along east-west-trending faults. Most of the regional faulting trends northwest-southeast, resulting in roughly parallel block faults having varied histories of deformation and sedimentation. Paralleling or lying en echelon to these faults are topographic prominences varying from mountains along the easterly border to hills and knolls within the plain area. The knolls within this plain reflect anticlinal structures which are now developed as oil fields. Productive areas also occur along the borders of the Basin. Most of the oil deposits are within beds of lower Pliocene and upper Miocene age. Local accumulations also are present in beds of upper Pliocene age, within middle Miocene, and in weathered or fractured schist of the basement complex.

The geologic development of the Ventura Basin was considered next by Thomas L. Baily, Consulting Geologist. The east-west trending Ventura Basin of southern Santa Barbara, Ventura and eastern Los Angeles Counties was described as one of the four important oil-producing basins of California. It has already produced over half a billion barrels of oil and contains a large proven reserve. This basin is 120 miles long and 20 to 40 miles wide; it lies between the Santa Ynez-Topatopa Mountains on the north and the Santa Monica Mountains-Channel Islands on the south.

The present axis of the basin approximately follows the Santa Clara River from its headwaters to its mouth near Ventura. Most of the western half of the basin, between Ventura and Pt. Concepcion lies beneath the waters of Santa Barbara Channel.

The culmination of the Coast Range orogeny that strongly folded and faulted both the oil-bearing foothills and the mountains was in middle Pleistocene time. The sea withdrew from the whole basin and the great Ventura anticline near the center of maximum Pliocene sedimentation was folded up several thousand feet above the sea; the traps were formed into which the oil of the prolific Pliocene fields migrated. The large San Cayetano, Red Mountain, Oak Ridge, etc. upthrusts with as much as 4 miles displacement and other types of faults were mainly developed during this orogeny and have continued to increase in throw until Recent time.

The genesis and evolution through the Tertiary Period of the Interior Valley Basin of California was discussed by Glenn C. Ferguson, Consulting Geologist, Bakersfield. The author pointed out that the inception and geological history of the Great Valley of California is allied closely with the diastrophism of the Sierra Nevadas and Coast Ranges. As a result, the valley has been subjected intermittently to a deluge of sediment since early Cretaceous. Evidence for the inception and continued development as a basin, employing the isopach and stratigraphic data, was considered.

Oil and gas prospects in Washington and Oregon were reviewed by Hampton Smith, Consulting Geologist, Los Angeles. After many years nearly complete quiescence, he explained, scientific prospecting for oil and gas in these states entered a period of accelerated activity during the war, which activity will probably continue for at least another two or three years.

The area of interest included several non-contiguous districts in a region 400 miles long and 100 miles wide. A number of operators have carried out extensive projects of surface mapping and seismograph work in one or more of these districts and 8 or 10 wildcat wells have been drilled or are drilling. A brief geological sketch of the areas around the wildcat wells was presented and an attempt made to re-evaluate these areas. The geology of several other prospective districts was outlined and the rapid change in facies in some groups of sediments and the resultant lack of any close relationship between prospects in different districts discussed.

J. J. Jakosky
National President of the Society of Exploration Geophysicists who addressed the Scientists at the opening of the meeting.

Petroleum Geology of Lands Bordering Pacific Ocean

In a paper dealing with the geologic framework of the Pacific Ocean, Walter H. Bucher, Columbia University, explained that the structural framework of the Pacific Ocean comprises the Cordilleran belt in the Americas and the broad zone that lies in the north between the island arcs and their counterparts on the Asiatic continent and in the south between the "andesite line" and the Australian and Antarctic continents. Folding dominates the framework everywhere, in well-known contrast to the other oceans.

In a discussion of the geology of the Japanese Islands, Charles W. Chesterman, San Francisco, stated that these islands are simply summits of a great mountain range that were separated from the Asiatic continent by depression of the intervening seas. The country is practically devoid of extensive plains and, for the most part, is quite mountainous.

Henry Salvatori
Chairman, Arrangements Committee

In a review of petroleum production and resources of Japan, David Gerkel and J. L. Williams revealed that the Japanese oil industry began in 1873. Ninety-five percent of the production is controlled by the Imperial Oil Company. To the end of March, 1946, the total production since 1874 was approximately 90 million barrels. The proved reserve is estimated to be 16 million barrels.

The subsurface exploration of the Bikini Atoll by the seismic refraction method was described by Milton B. Dobrin and Beauregard Perkins, Jr., Naval Ordnance Laboratory. The origin and internal constitution of atolls have for the past century been among the most challenging mysteries in all of geology. Seismic studies at Bikini revealed three zones with distinct seismic velocities beneath the lagoon bottom. The uppermost zone is about 2000 feet thick. An intermediate zone of undetermined nature has a thickness varying from 3000 to 11,000 feet. The deepest zone, presumably the igneous basement, appears to be a buried mountain forming the core of the atoll. The apparent existence of a buried mountain at 5000 feet below present sea level is of special interest in view of Hess' recent discovery that the Central Pacific contains numerous truncated cones with flat tops submerged at depths ranging from 3000 to 6000 feet.

Peter Misch, National Univ. of Peking, China, summarized the sand-mile segment of the Pacific structural types and trends in South China. At the southwestern border of China a geosyncline extends which is part of the prolongation of the Himalayan-Tibetan geosyncline. In western Yunnan it trends north by west and bends to southeast on the south, occupying southernmost Yunnan and northern Indo-China. The Paleozoic and Mesozoic of Burma belong to the same major unit, and from here another branch extends into Malaya, being separated from the South Yunnan-Indo-China branch by the mass of Cambodja.

Francis J. Turner, University of California, outlined the geological history of New Zealand in the light of recent contributions. The thou-

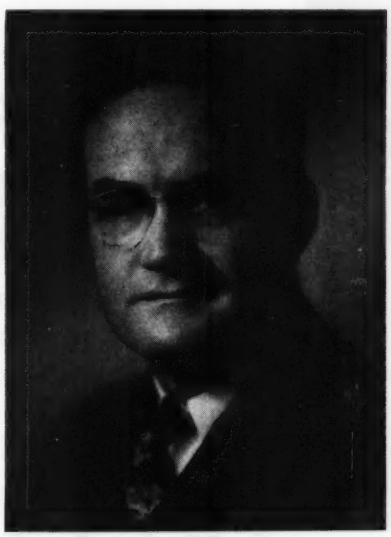
James A. Waters
President-elect of the Society of Economic Paleontologists and Mineralogists.

margin occupied by the islands of New Zealand, is an area of crustal weakness which, since early Paleozoic times has been characterized by cycles of geosynclinal sedimentation alternating with periods of orogenic disturbance. Rocks of the Mid-Cretaceous to Pliocene periods yield abundant indications of petroleum; but in spite of extensive exploration during the past two decades no considerable quantity of oil has been discovered.

The stratigraphic sequence in the Philippines was discussed by Robert M. Kleinpell, University of California. The Philippine archipelago represents in the main a northward extension of the folded deposits of that Cenozoic geosyncline which passes from the Himalayas southward through Burma, eastward through the southern Greater and Lesser Sundas and on around the Bunda Arc, northwestward and then northward through the region of Macassar Strait eventually to Formosa and Japan. Petroleum exploration, interrupted by the Japanese invasion, has recently been resumed under the supervision of Corby. A summary of such stratigraphic data as have been salvaged from the war are being prepared for publication.

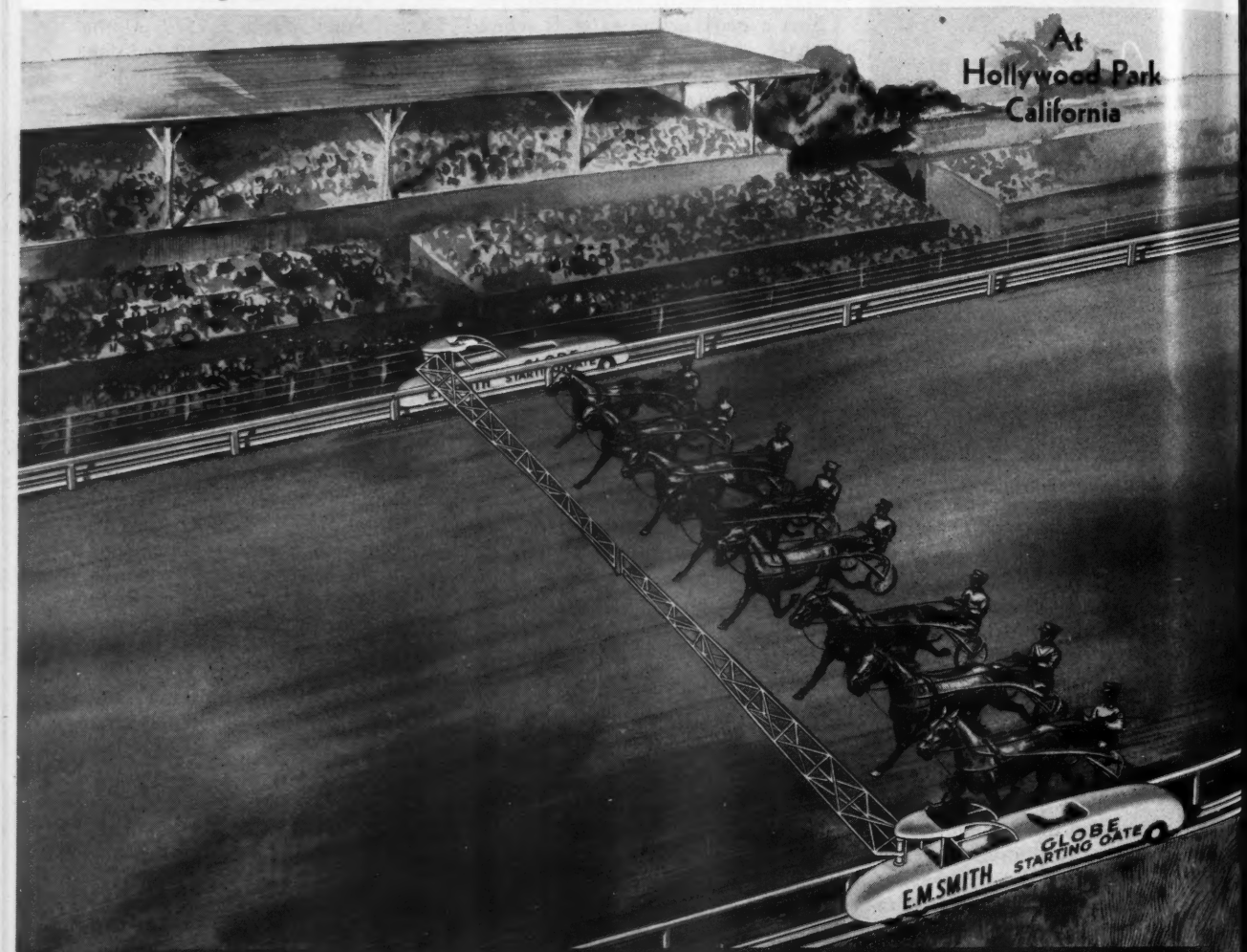
In a discussion of the paleographies of South America, L. G. Weeks, Standard Oil Co. of New Jersey, outlined the major features of the geologic framework of this continent. Attention was called to the many similarities between South and North America. It was pointed out that Upper Devonian sediments are unknown in South America. Mississippian marine sediments occur in the West Central Argentine embayment and at least locally in the Colombian seaway; and they may yet be found in the Cordilleran trough of Peru, Bolivia, etc., where continental beds of Mississippian and probably also Pennsylvanian ages occur.

In a consideration of Central America as a petroliferous province, W. P. Woodring, U. S. Geological Survey, pointed out that the thick marine Lower and Upper Cretaceous section of northern Central Americal and adjoining southeastern Mexico include adequate source



Cecil H. Green
Vice President and General Chairman of S. E. G.

GLOBE GOES TO THE RACES



INTRODUCING A NEW HORSE RACE STARTING GATE

This fast opening, mobile gate has been adopted for use at the spring meeting of the Western Harness Racing Association at Hollywood Park, California, April 11th, through May 17th, 1947. It is suited to both running and harness races.

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George Buchanan
Newly-elected Vice President of A. A. P. G.

rocks and reservoirs. It offers promise.

In a consideration of the petroleum geology of eastern Peru and Ecuador, Bernhard Kummel, Columbia University, pointed out that interest in the geology and petroleum prospects of these countries has fluctuated for the past 25 years. The only production now being obtained from this area is at the Ganza Azul field on the Pachitea River. Exploratory drilling is now underway in various places in both Peru and Ecuador.

The cyclic sedimentation in the Paleozoic rocks along the Alcan Highway in northern British Columbia, according to Lowell R. Laudon and B. J. Chronic, Univ. of Kansas, consists of Cambrian sandstone and quartzite of undetermined thickness; Silurian (Mt. Ronning) limestone and dolomite approximately 1,275 feet in thickness; three un-named Devonian limestone formations, 680, 600 and 410 feet in thickness respectively; Devonian (Ramparts) limestone 1,100 feet in thickness; Devonian (Ft. Creek) shale approximately 800 feet in thickness; and Mississippian limestone and chert 400 feet in thickness. No rocks of Pennsylvanian or Permian age were found in the area.

In the exploration and evaluation of petroleum possibilities in southwestern Alaska, Lewis B. Kellum, Univ. of Michigan, stated that the geologic province of southwestern Alaska affording the greatest promise of commercial oil production is a belt of Jurassic strata extending along the west side of Cook Inlet and the Shelikof Straits for 250 miles. It attains a maximum width of about 40 miles in the vicinity of Mt. Katmai and is bordered on the northwest and southwest by metamorphic rocks, probably of Paleozoic age, which are intruded by granite batholiths considered to be of early Jurassic age.

Petroleum Prospecting in Overthrust Areas

In a presentation on overthrust structure of the Alberta Foothills, Canada, Theodore A. Link, Chief Geologist, Imperial Oil Co., Ltd., described the Turner Valley Structure as an example of oil and gas accumulation within the porous Paleozoic limestone on the upthrown or over-riding mass of a thrust sheet in the Foothills of Alberta. Apparently the accumulation of the oil and gas, and its segregation from the water, took place before the development of the major or primary faulting. The Highwood Uplift, lying directly behind or west of Turner Valley, is a larger structural unit, rises much higher structurally, contains only small amounts of oil or gas and is primarily water-bearing.

Thrust faultings in the Ventura Basin, California, according to Edward C. H. Lammers, Standard Oil Co. of Calif., have been studied in extreme detail because they are intimately related to some of the larger producing oil fields in the district. The faults discussed—the San Cayetano, Oak Ridge, Santa Susana, and Del Valle thrusts—have to date been penetrated by over one hundred exploratory and development wells. The Oak Ridge and San Cayetano thrusts are classified as geanticlinal thrust faults, whereas the Del Valle and Santa Susana thrusts are classified as geosynclinal thrust faults.

Montana and Wyoming examples of overthrusting in relation to petroleum accumulation were reviewed by D. L. Blackstone, Jr., Univ. of Wyoming. Several occurrences of overthrusting in the Rocky Mountain region of Montana and Wyoming and their relationships to oil accumulation were presented by maps and cross sections. High angle reverse and low angle thrusts were considered. Structural lineaments that may control the location of overthrusting were pointed out.

Calif., Wyo., and Montana Fields

Discussing the geology of the Basement Complex in the Edison, California, field, John H. Leach, Independent Exploration Co., pointed out that the discovery of oil in the metamorphic basement complex in the Edison Oil Field has directed the attention of California geologists to this field and to other areas where metamorphic rocks underlie known structural highs.

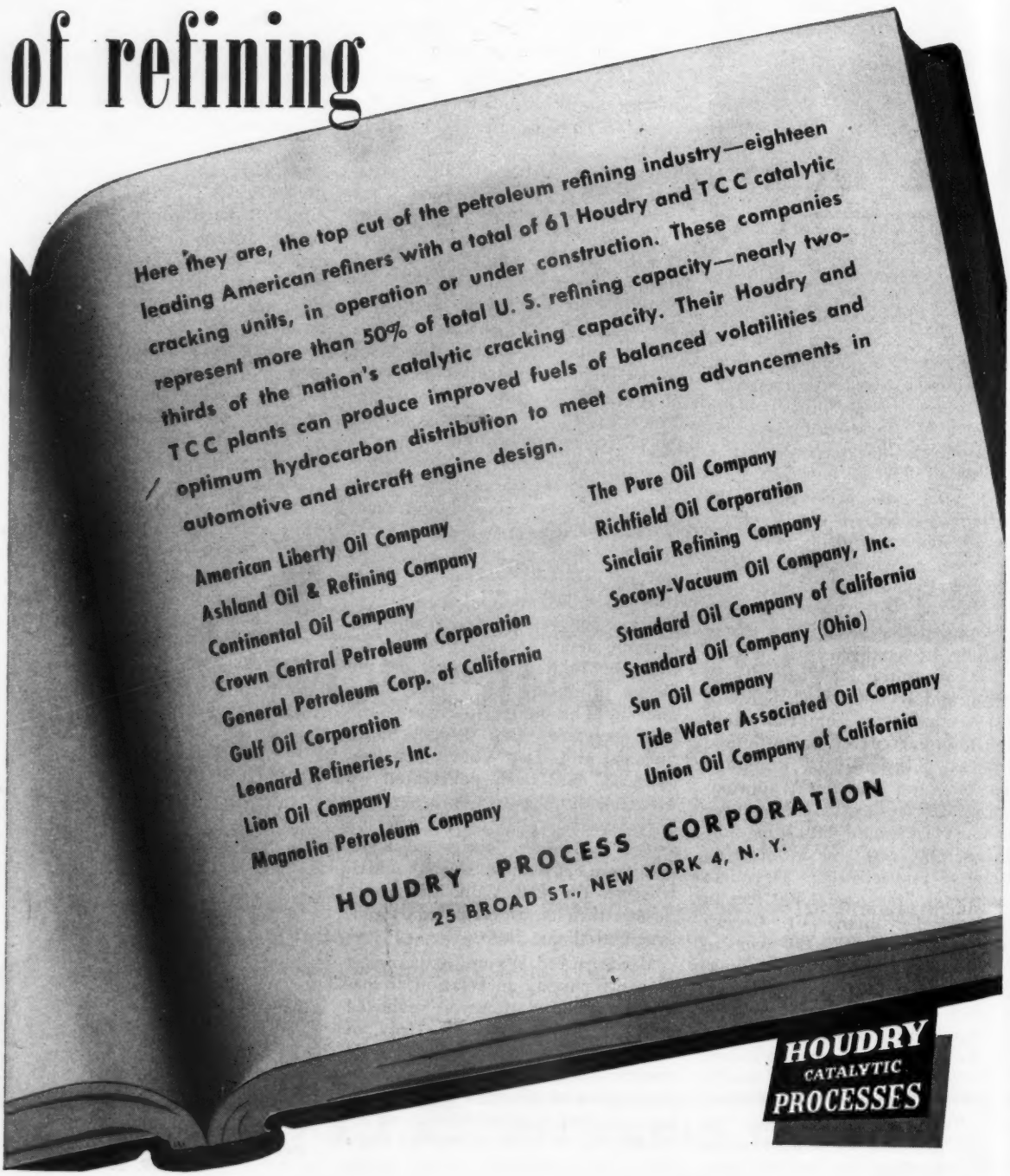
Structurally, the Edison Oil Field is a tilted fault block with abrupt basement escarpments present on the east and north. The regional dip is to the southwest. Faults contribute to the closure in the sediments although the primary cause for accumulation seems to be the thinning and overlapping of sands upon the uplifted fault block. The source of the oil found in the basement rocks is believed to be the organic marine shales which abut the basement on the north and west.

Paul T. Walton, Pacific Western Oil Corp., reviewing the Oregon Basin oil and gas field in Wyoming, stated that the most highly developed and important production is black, 22 gravity oil from the Permian Embar limestone and the Pennsylvanian Tensleep sandstone. This productive area occupies only

(Continued on Page 56)

J. V. Howell
Newly elected Secretary-Treasurer of A. A. P. G.

The list of Houdry licensees is the Blue Book of refining


Here they are, the top cut of the petroleum refining industry—eighteen leading American refiners with a total of 61 Houdry and TCC catalytic cracking units, in operation or under construction. These companies represent more than 50% of total U. S. refining capacity—nearly two-thirds of the nation's catalytic cracking capacity. Their Houdry and TCC plants can produce improved fuels of balanced volatilities and optimum hydrocarbon distribution to meet coming advancements in automotive and aircraft engine design.
American Liberty Oil Company
Ashland Oil & Refining Company
Continental Oil Company
Crown Central Petroleum Corporation
General Petroleum Corp. of California
Gulf Oil Corporation
Leonard Refineries, Inc.
Lion Oil Company
Magnolia Petroleum Company
The Pure Oil Company
Richfield Oil Corporation
Sinclair Refining Company
Socony-Vacuum Oil Company, Inc.
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The Application of Automatic Controls to Gasoline Plant and Refinery Processes

By E. H. Reynolds, Wm. Troutman and Gordon Lawn, Richfield Oil Corporation

Automatic controls have been widely applied to gasoline plant and refinery processes with resultant improved products, and at lower cost. If a theoretical process could be set up in which all the factors affecting the process, such as feed composition, heating and cooling media, rate of heat transfer, etc., remained absolutely unvarying, the process could be established and would thereafter continue without change. The need for the application of automatic controls, therefore, arises as a means of preventing variations of the factors affecting operation, or to compensate for their actual variation through control of suitable variables of the process. Thus, if variations in steam line pressure supplying a fractionation column kettle were upsetting operation, automatic control could be applied to control the steam pressure, or possibly to control the kettle temperature and thus compensate for the variations in pressure.

Usually it is not possible to set up a control which can directly measure and control the product required, and so the controls are set up to measure and control temperature, pressure, rate of flow, liquid level, etc., chosen in such a manner that their control will result in satisfactory operation with resultant production of the required product. For example, in controlling the operation of a deisobutanizer, it is not generally possible to analyze the products automatically with great speed and thus apply the automatic control based on this measurement. Instead, a suitable temperature in the column may be chosen which, at a given pressure, gives good indication of the product being produced, and the control applied to this temperature. Control can be applied to any suitable variable of a process which can be readily and rapidly measured, and which would aid in the overall control of the process;

February Meeting

such as specific gravity, pH, color, etc., as well as the more generally used temperature, pressure, rate of flow, and liquid level.

The successful application of automatic controls involves the solution of three types of problems. The first of these to be solved is the rapid and accurate measurement of the variables of the process to be controlled. Successful control is impossible without dependable measurement. The second type of problem to be solved is the rapid and precise application of corrective measures so as to maintain the controlled variable at the desired point with minimum deviation. The third type of problem is the selection of suitable variables of the process. The solution of the first two problems is largely contained in the control instrument and we will now go to a brief review of these instruments.

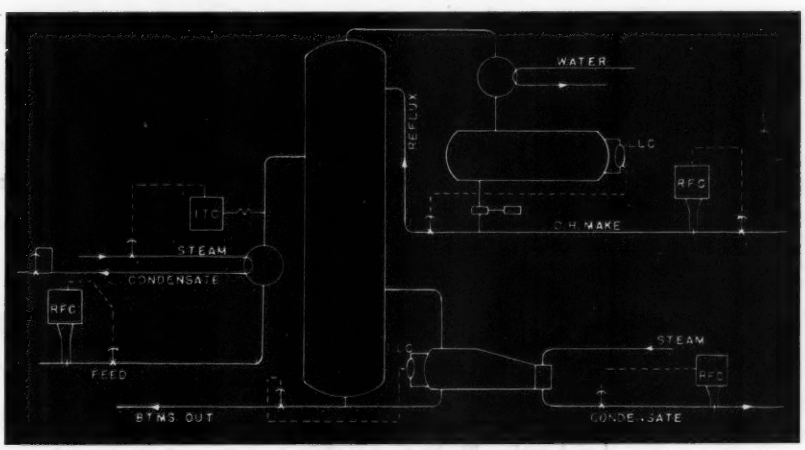
There are two general systems of control in industrial services: electrical and pneumatic. The pneumatic control is more modern and presents several advantages over the electrical. Its initial cost is less, it is more flexible, servicing is less complicated, and it presents no fire hazard. For this latter reason, probably more than any other, it appeals particularly to the Petroleum Industry, and is in such common use in this field that the terms "control", "controller", etc., appearing in this paper will be considered to apply to the pneumatic system only.

In choosing an instrument for a control job, it is necessary to consider its characteristics first as a measuring device, and second as a controller. The subject of measuring devices is too broad to be covered adequately in this paper. No attempt will be made to do more than note the more common types along with some of their outstanding characteristics and limitations.

Measuring devices can be noted as follows:

Temperature:—

Pyrometers: This class includes millivoltmeters and potentiometers. Both have as a primary element a thermocouple made of two dissimi-



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lar metals welded together at one end. The most common metal combinations in use as thermocouples in the Refinery are Iron-Constantan with a normal range of 0—1500°F. and Chromel-Alumel whose normal range is 0—1800°F.

A high degree of accuracy is obtainable with potentiometers. It is possible to have them check within ± .1% of total range. They make very satisfactory controllers. This is especially true of the continuous balance type, since temperature changes are recorded without delay.

Thermometers: Bulb-capillary type thermometers are widely used as they are generally less expensive than pyrometers. They are commonly classified as follows:

Class I—Liquid filled, other than mercury. Work on principle of volumetric expansion. Evenly graduated chart. Temperature limit 400°F.

Class II—Vapor tension. A change in temperature causes a change in the vapor pressure of liquid filling medium. Unevenly graduated chart. Temperature limit 600°F.

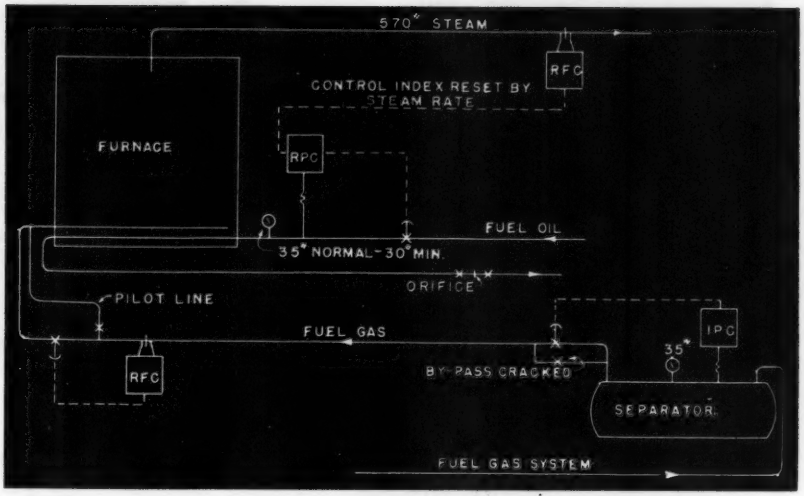
Class III—Gas filled. Volumetric expansion of gas. Evenly divided chart. Temperature limit 800°F.

Class IV—Mercury filled. Volumetric expansion of mercury. Evenly divided chart. Temperature limit 1200°F.

Ambient temperature changes along the capillaries of these systems cause errors, excepting in Class II, where they are minimized. Compensators are necessary to overcome this effect, especially where long capillaries are used. This type thermometer should not be used as controllers when capillaries are over 200 ft. in length since lag is too great.

Pressure:—

Pressure measuring devices are distinguished by the type of primary element employed—Bourdon tube, spiral, helix, and metallic bellows. Usually the Bourdon tube is used for high pressures, the spiral or helix for intermediate pressures, and the metallic bellows for low pressures. Location of pressure taps should be given some thought, remembering that the primary element will measure any static head present in addition to vessel pressure.



Refinery Fuel System Press. Control

Flow:—

The differential type flowmeter with an orifice plate for a primary element is the standard means of flow measurement in the Petroleum Industry. There are two general classes in use, the mercury manometer, and the sylphonic-bellows. The former is the older and by far the more common type.

The differential flowmeter is readily adaptable to control purposes.

Liquid Levels:—

Liquid levels fall into two general classes, float type and differential type. The first includes the recently developed displacement type liquid level. The differential type is an adaptation of the familiar differential flowmeter.

It is common practice to let the level of the liquid swing between certain limits rather than holding it to a fixed point. This permits the addition or withdrawal of liquid from the vessel at a more gradually changing rate and may cause less upset in the process.

In the study of a control problem, consideration must be given to the type of control element best fitted for the particular job. There are available—

(1) The On-Off Controller in which the control valve is either wide-open or closed, depending on the position of the variable with respect to the control point. It has some application in batch processes.

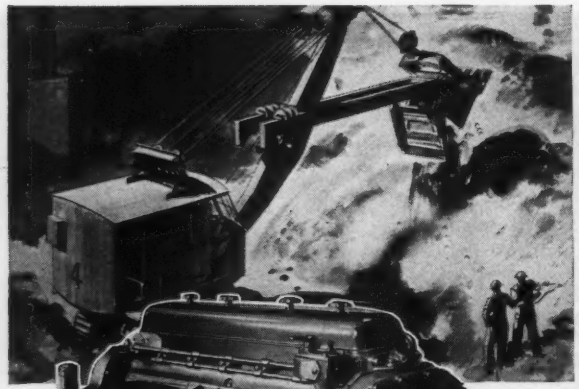
(2) The Narrow Band Proportional Controller in which the control valve moves with the pen as it deviates from the control point, but at such a rate that a pen movement of from 1% to 10% of the chart range, depending on the throttling range setting, will move the valve from a closed to a wide-open position or vice versa. This control is useful in processes having very small time lag. It is designed to check the process deviation, but will not bring it back to the control point.

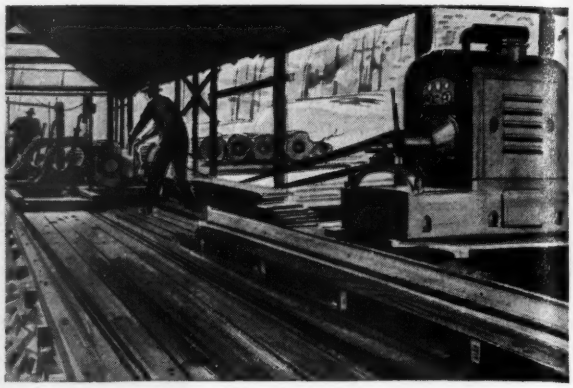
(3) The Wide Proportional Band Controller is the same as the Narrow Band Controller, excepting that it allows a choice of throttling ranges of from 1% to 150%.

(4) The Proportional Controller with Automatic Reset in which the addition of automatic reset to the Wide Band Proportional Controller makes it an element that will not come to balance until it has changed the air to the control valve sufficiently to bring the variable back to the control point. It is adjustable so as to set the rate at which the process variable will be returned to normal setting.

In many operations, control is improved by the inclusion of a valve positioner. This is true whenever conditions arise whereby the control valve does not readily respond to small changes in air pressure. They function by continuing to increase or decrease air pressure on the valve diaphragm until the valve assumes the position required by the primary control.

Consideration must be given to the ability of the measuring element





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because—

there's power at every downstroke

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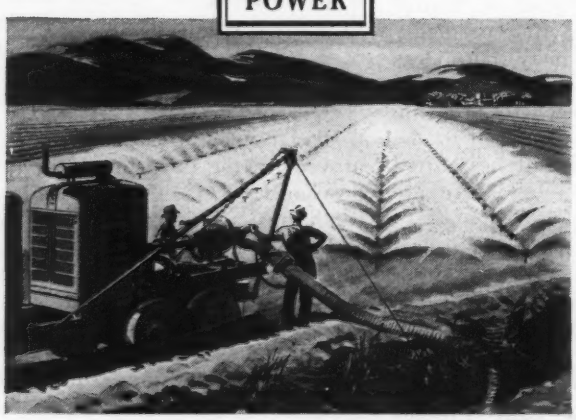
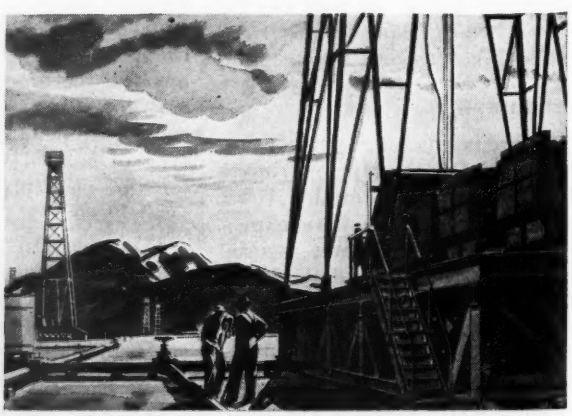




GENERAL MOTORS CORPORATION
DIESEL ENGINE SALES, PETROLEUM INDUSTRY, 1504 PHILTOWER BUILDING, TULSA 3, OKLA.

of any controller to quickly detect a variation in the controlled medium and to actuate a mechanical device to correct this variation without undue loss of time; otherwise lag is introduced into the process. Lag is a term used to indicate the time interval between a process change and the re-positioning of the final control element as a result. This can be broken down into (1) process lag, and (2) measurement-control lag. Lag is the principal bugbear of good control and its effect must be minimized whenever possible.

In order to fully appreciate the number of sources of lag in a control system, let us consider a bulb type temperature controller. A change of temperature outside the thermometer bulb is transmitted through the bulb wall and into the filling medium. This increases the pressure in the bulb, this pressure travels through the capillary to the spiral, moving the spiral. The spiral works through the control mechanism sending out a new air pressure through the connecting tubing to the control valve. The control valve changes the quantity of controlling medium. These steps follow in sequence, and although they overlap to some extent, there is, of necessity, an unavoidable time lag. This inherent lag is not the same for all types of measuring devices, nor is it the same for various makes of pneumatic systems. Consideration should be given to this when planning the control of a critical process.

At any of the numerous steps between the variable change and the final control element, sufficient lag may develop to greatly impair the usefulness of a controller. Causes of lag in a temperature controller might be:

The bulb or thermocouple is poorly located in the equipment.

The well is too heavy, or of poor thermal transmission qualities, or dirty.

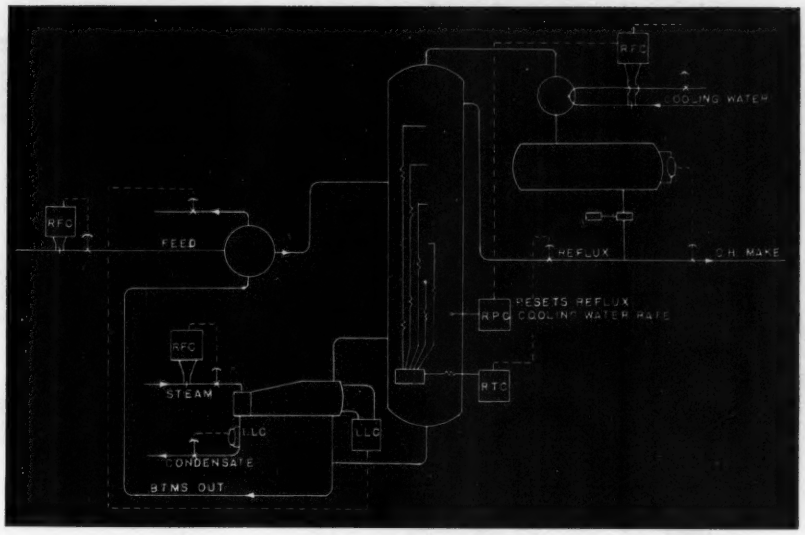
There is an air space between the bulb and well.

The bulb is not fully immersed.

The capillary is too long.

There is loss of sensitivity in the measuring element.

There is lost motion or friction in controller elements.



Deiso Butanizer

The pneumatic pilot has low capacity.

There are air leaks in pneumatic system.

Control valve action is sluggish.

Recently a study was made of the lag characteristics of copper tubing to determine the relative effect of tubing sizes and lengths. The test covered ¼"; 5/16" and ⅜" tubing in lengths of 50 ft. to 300 ft. by 50 ft. increments. To simulate operating conditions, a control valve with pressure gauge was attached to one end of the tubing. The controllers were set to deliver 15-½ lbs. air and a cock was introduced between the controller and tubing. The time interval between opening the cock and the showing of 15 lbs. at the control valve was clocked. Four standard controllers were used. One of the controllers developed less lag in the 5/16" tubing than in the ¼", being 10% faster for 50 ft. and 5% faster for 300 ft., it was slower when tested with ⅜" tubing. The other three controllers made their fastest delivery through ¼" tubing for all lengths tested. No two controllers delivered air at the same rate, and they held their relative positions throughout the tests, the one being fastest for any length of any diameter tubing was fastest for all lengths and all diameters. The relative delivery rate of the fastest and slowest controllers was about 6:1.

With the control instruments that we have to work with in mind, let us now turn to the problem of selecting the variables to be controlled, and go to Slide No. 1. This process is the operation of a deisobutanizer column. Feed to this column has approximately the following composition:

Propane— 1 to 2%.

Isobutane—6 to 10%.

N-butane and heavier—88 to 93%.

The operation desired is production of an overhead containing a minimum of n-butane, while very low loss, say of not over .1% of isobutane is permitted in the bottoms.

The factors affecting the process that must be controlled or compensated for, are:

Feed composition and rate.

Cooling water temperature and pressure.

Steam temperature and pressure.

Tower heat loss.

The flow controller on the feed controls the feed rate directly, since variation would throw an additional load on all ensuing controls.

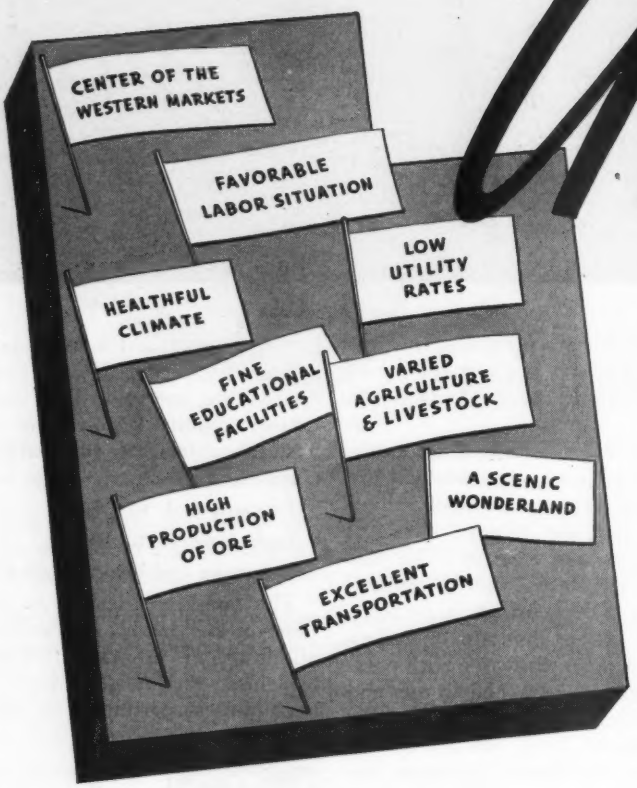
The flow controller on the steam to the re-boiler is used to minimize fluctuations of heat input due to variations of steam pressure. A pressure controller on the re-boiler steam pressure might be preferable to the flow controller used, but the flow controller was on hand and was used since variations in heat input are compensated for by other controls.

The liquid level control on the re-boiler condensate is used to release

UNION PACIFIC

TREASURE MAP OF INDUSTRY

Utah *



Herbert B. Maw, Governor of Utah, tells his state's story.

"Nature was kind to Utah. Deposited within her borders are rich and varied sources of coal and iron, lead and zinc, copper, silver and gold. These and many other industrial attributes are part and parcel of the undeveloped sections of this state.

"A gigantic steel industry which can serve the west signals our industrial ambition. It will form the nucleus of a network of associated industries.

"Our need now is people and leadership to share in the prosperity of a western empire. Our natural resources are practically untouched. They assure a long life to an industrial future which is just now beginning. Utah invites new and expanding industry to investigate opportunities here before deciding upon new locations."

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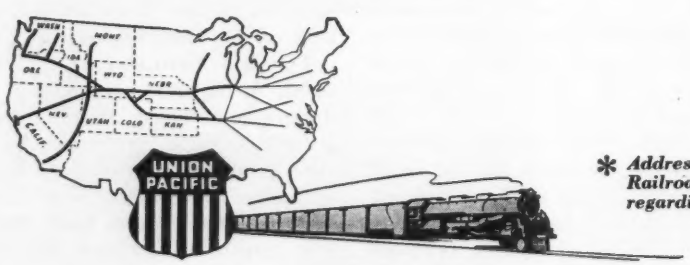
* *One of a series of advertisements based on industrial opportunities in the states served by the Union Pacific Railroad.*



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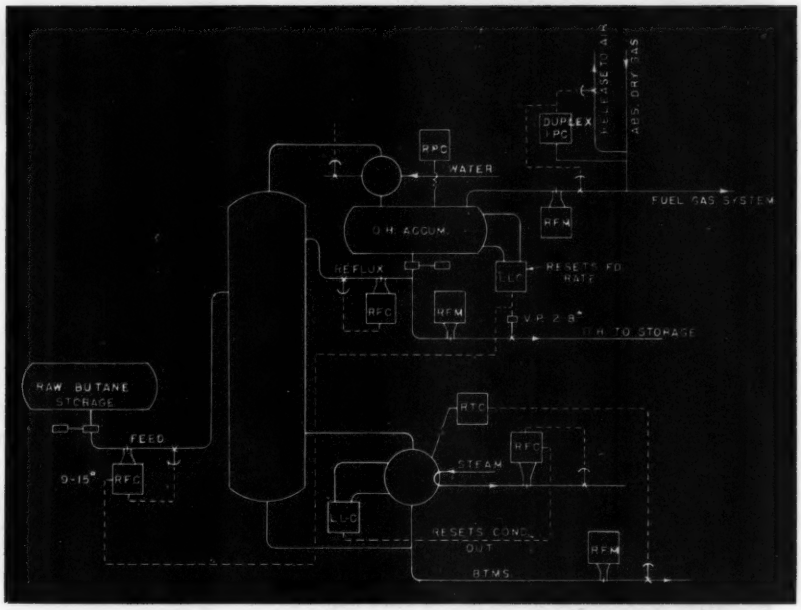
UNION PACIFIC RAILROAD

THE STRATEGIC MIDDLE ROUTE

condensate from the re-boiler at whatever rate formed.

The temperature control is used to control the temperature on one of several points in the tower, since at constant pressure this will maintain the products close to that desired despite normal variations in feed compositions, heat input, and tower heat loss. Location of the point at which the temperature in the tower is controlled must take into consideration the particular type of operation desired. If the temperature at the bottom of the tower were controlled, variations in the heavy material in the feed stock would affect this temperature without necessarily reflecting a change in the overhead product. If the top temperature of the tower were controlled, the varying propane content would have an appreciable effect on this temperature, and so the n-butane content would vary inversely. By selecting an intermediate point, it is possible to minimize the effect of variations of propane in the overhead and still have a point which will vary with changing n-butane content of the overhead. The actual point used is the 53rd tray from the bottom in a 70-tray tower. This temperature is controlled through varying the reflux to the tower since reflux enters at a point near enough to that of temperature measurement that a reasonable time lag in the process will result.

The pressure control tap should be as close as possible to the point at which the temperature is controlled, since a given temperature controls the product produced only at a given pressure. The pressure control operates by controlling the cooling water through the overhead condenser, thus varying the condensing rate on the overhead. In order to compensate for variations in cooling water pressure without first requiring a change of pressure in the tower, a flow controller is used in the overhead condenser water system. The tower pressure controller resets the control index of this flow controller. This is necessary in the particular application because of other equipment taking off of the same cooling water system, and in cutting between isobutane and n-butane with a difference in boiling



Fuel System Make-Up

point of 19°, very close temperature and pressure control are required to maintain product composition.

The liquid level control on the overhead controls the overhead make and thus adjusts for the varying ratio between overhead and bottoms due to feed stock composition change. The liquid level control on the re-boiler serves the same purpose, but it might be noted that this is a differential type controller having proportional control with automatic reset, and is used because it is desired to maintain the bottoms flow at as constant a rate as possible and still keep the level within limits. This is necessary on account of the bottoms heat exchange with the feed stock so that the temperature of the feed to the tower will remain as constant as possible.

Slide No. 2 represents application of automatic control to a deisopentanizer tower. Feed to this column is of approximately the following composition:

N-butane—0 to 1%.

Isopentane—45 to 49%.

N-pentane—50 to 54%.

It is desired to produce an overhead containing as much of the isopentane as possible with not over 7% n-pentane.

It should be noted that both the overhead and bottoms products desired are nearly pure products, hence have little change of boiling point with the amount boiled off. It is not practical to control this operation by the use of a sufficiently sensitive temperature and pressure control at a mid-point within the column as was illustrated in Slide 1, due to the very small difference in boiling points (approximately 9°) between the isopentane and n-pentane. The temperature at the point of measurement would have to be held to within a fraction of 1°. Instead, advantage is taken of the fact that the feed composition changes slowly and the tower is set up to make a given split between overhead and bottoms, this split being varied in accordance with tests on the overhead and bottoms products.

The factors affecting the process that must be controlled, or compensated for, are:

Feed rate.

Cooling water temperature and pressure.

Steam pressure and temperature.

Tower heat loss.

The flow controller on the feed controls the feed rate directly. The temperature controller after the feed pre-heater controls the heat input with the feed and compensates for variations in steam pressure to the pre-heater. The flow controller on the condensate from the re-boiler controls the heat input through the

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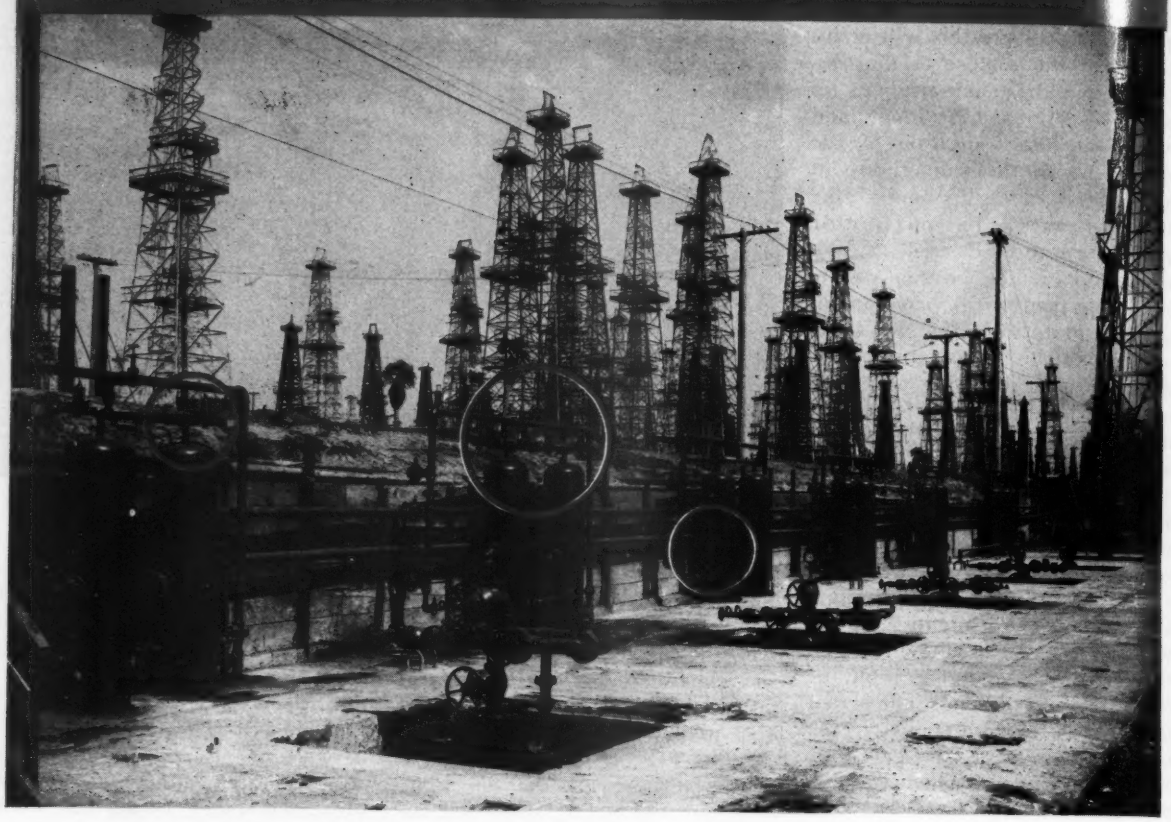

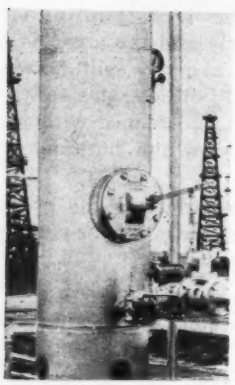

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re-boiler and compensates for changes in steam pressure to the re-boiler. The flow controller on the overhead product sets the split between overhead and bottoms. The liquid level control on the overhead accumulator compensates for any changes in heat input or cooling by varying the reflux rate to hold this level. The liquid level control on the bottoms controls the bottoms make as available, while maintaining a liquid level in the re-boiler.

Slide No. 3 represents application of automatic controls to the problem of maintaining the pressure in the Refinery fuel gas system by burning the excess gas under the steam boilers. In the Refinery there are many processes consuming fuel gas and many processes releasing gas into the fuel system. Due to variations in operation, the balance on fuel gas in the Refinery is always changing. Before the present controls were set up, commercial gas was available to take this swing. When this was no longer available, it became necessary to either waste large quantities of gas during periods of excess, or to arrange to satisfactorily use this gas in varying quantities as available. Many fluctuations in this gas are too fast to permit manual adjustments of fuel gas consumption in the Refinery.

Referring to Slide No. 3, a pressure controller on the fuel gas line controls the pressure on this line by releasing gas to the burners under the boiler. The flow controller on the steam from the boiler controls the fuel oil to the burners in order to compensate for variations in the amount of gas burned, as they tend to cause a change in the steam flow. In order to compensate for variations in the fuel oil supply pressure without first causing a change in the steam flow, a pressure controller is used on the fuel oil to the burners. The flow controller on the steam resets the control index of the pressure controller on the fuel oil. The flow controller on the fuel gas to the boilers serves to limit the amount of gas which can go to the boilers since it will not permit passage of more gas than it is set for at the maximum orifice plate pressure, which would be the fuel gas system pressure.

The above control system will accommodate changes of rate in the available fuel gas of approximately 150,000 cubic feet per hour, making this change if necessary in 2 to 3 minutes without noticeably affecting the output of the boilers.

The above fuel system pressure control arrangement is sufficient to accommodate most normal changes but is not sufficient to take care of surges sometimes caused by upset operation, particularly of a cracking plant. These plants can very suddenly change from a net producer of fuel gas to a very large consumer of gas when operation is badly upset by say a power failure. At a time such as this, if the large quantity of fuel gas required were not immediately available, temperatures would continue to fall and operation would be lost. There are also times due say to a sudden increase in fuel gas from the vapor recovery system, when the excess fuel gas is temporarily more than can be burned.

Slide No. 4 shows an automatic means of limiting variations of fuel gas pressure by use of a duplex pressure controller which will allow make-up gas to go to the system when the pressure drops to a set point, or will vent gas to the air if the pressure rises to a pre-determined point. In order to automatically have gas available for make-up into the fuel system, a stabilizer is kept in operation feeding n-butane stock, the overhead from which returns to the feed tanks while the bottoms product containing any material heavier than n-butane is discarded to other tankage. The operation desired on this stabilizer is the supplying of fuel gas containing nothing heavier than n-butane, at any time, and in whatever quantities are required.

Referring to Slide No. 4, when no make-up gas is required the feed to the stabilizer is controlled at a pre-set minimum which will allow the feed pump to operate properly. As a level is built up in the re-boiler, the re-boiler liquid level control increases the flow of condensate from the re-boiler by setting the control index on the condensate flow control until all material in excess of that required to maintain the re-boiler level is boiled off back into the tower. The temperature control operates from the re-boiler temperature and adjusts the bottoms rate to permit removal of all material heavier than n-butane. In order that the temperature of the material in the re-boiler will indicate its composition, a constant pressure is maintained. The pressure controller which does this adjusts the water rate through the overhead condenser. Material not going out as bottoms will go overhead and appear in the overhead accumulator. The liquid level control on the overhead accumulator adjusts the overhead make to maintain a level in the upper part of this vessel. The flow controller on the reflux to the tower maintains a set reflux rate sufficient to insure removal of the heavy material in the bottom product.

When make-up gas is withdrawn for the fuel system, the pressure controller decreases the amount of overhead condensation to maintain the set pressure. This results in the liquid level in the overhead accumulator starting to drop, causing the level control to decrease the amount of overhead returned to storage. The control valve on the overhead product is coupled with a valve positioner set to give full valve travel for a 2-8 lb. range of the controlling air pressure. When the liquid level on the overhead accumulator has reached mid-point, the overhead valve is closed. If the gas release is greater than the minimum set feed will provide, the liquid level in the overhead accumulator will continue to fall and thereby increase the feed to the tower by raising the control index on the feed flow controller. The control index of the feed controller was adjusted in our own shop so that it travels full scale for a 9-15 lb. range of the controlling air pressure. However, there are now commercially available index setting mechanisms which are adjustable both as to the air pressure at which motion starts and also as to the rate of movement with change of air pressure.

When the gas requirement for make-up to the fuel system decreases, the above process reverses itself and will return to the original operation or will stabilize itself at any intermediate point.

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Problems of Unitization

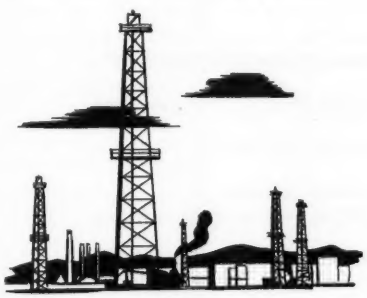
R. M. Williams
Phillips Petroleum Company

It is a far cry from the time when in 1924 Henry L. Doherty first dared to assert to an industry made up of a group of successful individualists that unitization was the only proper method of developing and operating an oil reservoir, and the present time in 1946 when, as an accomplished fact, we can look at the successful unitization and unitized operation of such oil and distillate pools as Salt Creek, Kettleman Hills, Lance Creek, Cotton Valley, Erath, Haynesville, Schuler, South Burbank, Billings, South Jennings, Paloma, Katy and countless others too numerous to name. Special mention should be made of the newest member of the family, Elk Basin, with a total of 17,683 acres owned by 29 working interest owners.

The undiscerning individual who gazes upon the magnitude of these projects in the light of the finished article; hears the engineers tell of their success beyond all expectation; sees the satisfaction of the operators because of a substantially increased recovery at materially less cost; observes the general contentment on the part of royalty owners, with a minimum of backwash from the standpoint of litigation; senses a complete lack of friction in matters of operation; is struck by the silence of the vent lines which previously howled with the waste of gas; and notes the lack of necessity of control by regulatory bodies, would no doubt be tempted to think that unitization presents no problem and that a subject such as mine—"Problems of Unitization"—is archaic. Surely no one here is so disillusioned.

Unitization with Divided Ownership a Problem

As we all know and have had proved to us time after time, unitization is all that it is claimed to be and is the ultimate answer to such problems as conservation, procurement of the greatest recovery of oil, the prevention of the waste of gas, proration, economic operation, elimination of unnecessary wells, protection of the correlative rights, balance between supply and demand and, to a large extent, federal control, because unitized pools once in operation have proved themselves to be without the need of outside governmental control, either state or federal. I would not discredit any of these advantages. They are real. Yet, with all the advantages and the benefits to be obtained, the proposed unitization of any pool having divided ownership is faced with an overproduction of problems—problems that can only be described by the term "headache"—problems that, in a majority of cases, thwart the objective to be accomplished.



It is concerning some of these problems that I have been asked to here address myself today. What I have to say may be a rehearsal of what you already know and have personally experienced. It should not, however, be time wasted because it is only through a repeated discussion of these problems that we can come to a better understanding and accomplish their solution. Although time, experience and meetings such as this have eliminated or solved many of the problems of the early advocates of unitization and others are rapidly disappearing or are very much minimized, it can still be said that one of the greatest problems involved in any proposed program of unitization is a lack of understanding and information on the part of so many operators as to what it is all about. You would be surprised at the nature of the questions asked by so many.

Problem Divided Between Lawyer and Engineer

At the outset, as a lawyer talking to his fictional rival, the engineer, or perhaps I should say a "Daniel in a Lions' Den", it gives me some satisfaction to shift back to you the burden with respect to what once was a real problem thrown into the laps of the lawyers. I have personally sat in many meetings of operators, engineers and other technologists who have been in enthusiastic accord as to the advantages to be gained through unitization of different pools; meetings at which the discussion conclusively established that through unitization of such pools millions upon millions of barrels of oil that would otherwise be lost could be recovered by means of wells already drilled and with a minimum of cost if unitization could only be accomplished. One such meeting, or rather a series of meetings, had to do with the Wilcox zone of the Oklahoma City field where it was conceded with but little question that upon the abandonment of primary competitive methods of operation not less than 560,000,000 barrels of oil will be left in the ground unrecovered and unrecoverable without unitization, of which a minimum of 80,000,000 to 100,000,000 barrels of oil can be recovered through unitization and the injection of gas. Think of it! An amount of oil greater than the total reserves of many of the newer pools considered by the Industry as being among its best discoveries of recent years. Proof of the possibilities in this regard has been established by the cooperative efforts of the operators in the south end of that field where over a period of years they, through gas injection have flattened the decline curve and have long since produced more oil than it was ever thought could be recovered and are still operating wells which in other parts of the field would long since have been abandoned.

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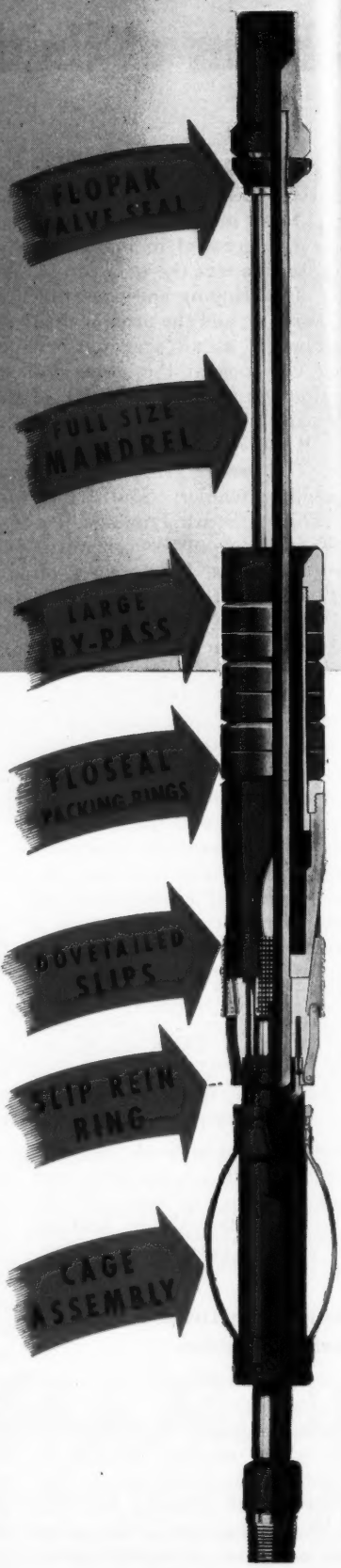

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Is The Law An Obstacle To Unitization?

In practically all the meetings to which I have made reference the conclusion has been the same, namely, that the engineers are ready to go; that there is no question as to the results; that science has the know-how, but that our laws are inadequate and stand in the way of scientific progress. Such has been the charge for years.

Leonard M. Logan in 1930[1] in a review of Mr. Doherty's advocacy of unitization, placed his finger on the law as being the root of the evil. He said:

"His study of the situation has convinced him that all of these evils were rooted in the laws under which the producing division of the petroleum industry operated, i.e., the recognition of property rights in oil and gas only after they have been reduced to possession—the 'right of capture' —and the fact that ownership of leasehold of the surface gave only the right to explore for oil and gas."

Robert R. Penn[2] in addressing the American Petroleum Institute in Dallas, Texas in 1931 had this to say in regard to unitization:

"All of us have realized fully that this was desirable from both an engineering and a production standpoint—that immense economy could be effected and it was the only complete and thorough way to control production and prevent such conditions of waste as we are now suffering from."

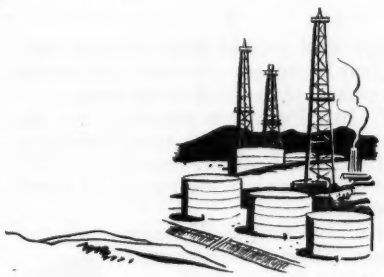
But went on to say:

"We have failed to get our laws adjusted so that they will fit the true condition of the industry."

I pause to observe another statement made by Mr. Penn wherein he said:

"Now is the time to stop preaching and to get down to actual practice in earnest; for we know that only through the reduction of drilling operations we hope to get real relief, and that the only practicable way to reduce drilling operations is through effectual unit operation of all major pools."

Fifteen years have elapsed since this admonition by Mr. Penn but still, in respect of many pools, we continue only to preach. Perhaps I shouldn't say "only preach" because in respect of most of these pools we, in addition to our preaching, continue to drill unnecessary wells, continue our waste of reservoir energy, continue our disproportionate taking of production and subject ourselves to the criticism of which our own preachments convict us. In many instances our sermons are but funeral addresses over the dead remains of pools that otherwise had prospects of long and happy lives.



In the reports of various industry committees to the Federal Oil Conservation Board and in the report of that board to the President of the United States, the major problems of unitization are abandoned on the doorstep of the laws with which the industry claimed that it was shackled.[3]

Legal Considerations No Barrier To Unitization

H. C. Miller and Ben E. Lindsly in their extensive report to the 1934 Congressional Investigating Committee,[4] after pointing out all the advantages of unitization, the progress made by the engineers and what could be accomplished from a scientific standpoint, conclude by saying:

"Legal considerations are the real obstacle in the general unitization of oil pools. So long as the law of the land considers oil and gas subject to capture, belonging to whoever reduces them to possession, any plans for unitization of oil pools are dependent on voluntary agreement between owners of the oil and gas rights in the common pool."

Engineers even had the lawyers believing that this was true. The Committee of the Industry's most outstanding lawyers appointed by the American Bar Association, whose report is included as a part of the report of the Federal Oil Conservation Board to the President, to which I have already made reference, makes no denial of the charge.

There was a time when I, too, was guilty of this same heresy.

But let me say to you now and with conviction that in my opinion legal considerations no longer constitute any real problem standing in the way of unitization. No longer can the law-makers and the courts stand convicted of such a charge. The legislatures of the several states, particularly that of Oklahoma, and the courts generally have shown themselves ready, willing and able to do whatever is reasonable and proper to keep pace with every advance in the science of producing, conserving, prorating or marketing of oil and gas and of adjusting the rights of the several individual owners to conform with the best interest of all.

Let us briefly look at the record.

As early as 1893, when the Industry was still in swaddling clothes, attention was called to the waste of gas to the injury of adjoining landowners. Indiana passed a statute prohibiting such waste. The court was not backward in its approval of such a law. In the case of Ohio Oil Company v. Indiana,[5] decided in 1900, the Supreme Court of the United States in sustaining the Indiana statute had this to say:

"On the other hand, as to gas and oil the surface proprietors within the gas field all have the right to reduce to possession the gas and oil beneath. They could not be absolutely deprived of this right which belongs to them without a taking of private property. But there is a coequal right in them all to take from a common source of supply the two substances which in the nature of things are united, though separate.

"In consequence of the nature of the deposits, of their transmissibility, of their interdependence, of the rights of all and of the public at large, the state could lawfully exercise the power to regulate the right of the surface owners among themselves to seek to

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D-	13 SN-	114 SW
D-	13 SN-	114 DW
D-	13 SB-	80 DW
D-	13 SB-	114 SW
D-	13 SB-	114 DW
D-	15 SN-	114 SW
D-	15 SN-	114 DW
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D-	21 LN-	160 SW
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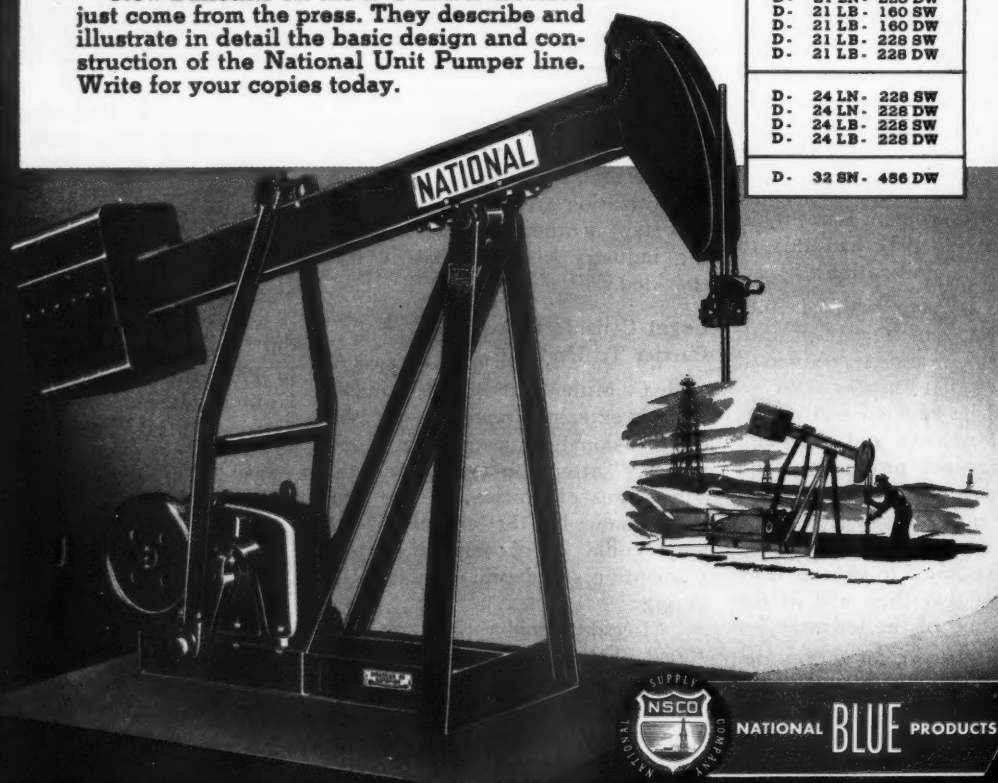

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obtain possession, and to prevent the waste of the products in which all of the surface owners within the area wherein the gas and oil were deposited, as well as the public, had an interest, because in the preservation of these substances the well-being and prosperity of the entire community was largely involved."

Show me any recent scientific dissertation with respect to unitization or other advances in the science of producing oil, no matter how late, that is as advanced as is the foregoing declaration by the Supreme Court in 1900 in respect of the science of producing oil and gas.

Courts Not Arbitrary Or Technical

When pipe line control became a problem, the legislatures of the different states acted. The courts approved.

Then with the flush days of Glen Pool, Cushing and Healdton came the need for proration and the reduction of production to market demands. Oklahoma passed its 1915 proration act. It was sustained.

When the evils of town-lot drilling at Oxford, Kansas and at Oklahoma City became apparent, the Industry had only to call the problem to the attention of the proper authorities. Ordinances creating unitized drilling blocks were adopted. This was unitization on a small scale, but unitization just the same. The courts said "That's fine".

Engineers then said that well spacing generally was needed. Texas adopted its Rule 37. Oklahoma, Louisiana and other states enacted spacing laws. Again the courts didn't quibble.

When in connection with the application of Rule 37 in Texas the engineers conceded the matter of allocating production was not an exact science so as to arrive at the answer with any mathematical accuracy, the courts didn't become arbitrary and technical, but had this to say:[6]

"While it is impossible to measure the quantity of oil and gas beneath each tract of land, or to give exact justice to all landowners, the rule and the exception can be so administered as to prevent the invasion of property rights by fairly and reasonably, but of course not exactly, protecting each owner in the ownership of, and the opportunity to save and produce, the oil and gas which according to the decisions in this state he has the right to take."

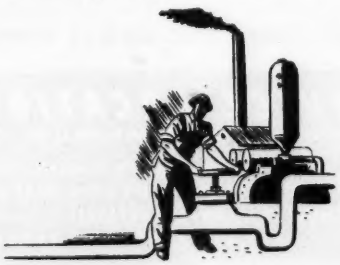
What greater liberality could be asked of the courts?

Legislatures Reasonable

Then, lastly, when the Industry loosed the discussion of pool unitization from its own counsels and let the public in on the secret, we find the legislatures of such states as Oklahoma, Louisiana and Arkansas passing forward-looking legislation on the subject. In Arkansas the Corporation Commission, acting under the authority of the legislation passed in that state, gave sanction to the Schuler Unit. In Louisiana, Haynesville and Cotton Valley came into being. I have here the Southern Reporter advance sheet dated April 11, 1946, in which is reported the case of Crichton v. Lee, fresh from the pen of the Supreme Court of Louisiana, in which the highest appellate court of that state sustained a fieldwide unitization of the Cotton Valley pool under the law of Louisiana to which I have just made reference.

I have yet to find any well-considered opinion of any court which has refused to go along or so construe the law so as to prevent the putting in force of any sound and reasonable program of oil and gas proration or conservation advocated and approved by the Industry and its technologists. The courts and the lawyers should resign their position as "whippingboys". The problem does not rest with them. It rests with the Industry.

I do not mean that legal considerations are to be treated lightly; that the property rights of the several owners can be arbitrarily dealt with or disregarded; or that in certain of the states enabling legislation may not be necessary. I mean that when the engineers and operators work out a plan of unitization that is scientifically and practically sound and that is fair and reasonable in respect of the necessary adjustments of the rights of the parties, the law-makers and the courts can and will in my opinion readily find a way to give it legal sanction and approval. Legal considerations are not, therefore, any real obstacle standing in the way of unitization.



The Royalty Owner

Then, there is the much talked of problem of the royalty owner. It must be granted that he presents a problem, but like the courts, he is charged with being a greater problem than he really is. We make of him a whippingboy. From personal observation, I would say that many of the willy nilly disagreements between the working interest owners who profess a desire to unitize relegates the problem of the royalty owner into insignificance in comparison. If the operators could get together and settle their differences, I will take my chances with the royalty owners.

The real problem with respect to the royalty owner is twofold: First, the average royalty owner has no knowledge of the oil business. He has no technical staff to advise him. We have not seen fit to take him into our confidence. Thus through lack of knowledge or understanding of the problem, he is naturally suspicious. It is no wonder when the royalty owner is approached his defense mechanism takes on the form of an adverse attitude. Second, of recent years the royalty owner has become more and more diversified and scattered to the four corners of the world and, even assuming his desire to unitize if contacted and the project explained to his satisfaction, the task of making contact and such explanation is difficult, if not impossible. Death, probate proceedings, insanity, trusteeships, receiverships, minority and other forms of legal disability involving the various royalty interests have to be taken into account.

Then, of course, there is of necessity the recalcitrant royalty owner who, calling himself an individualist

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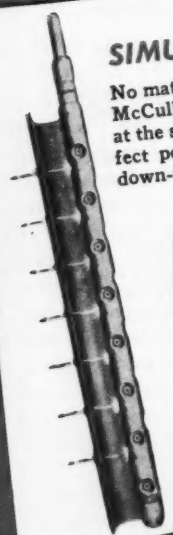

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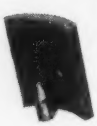

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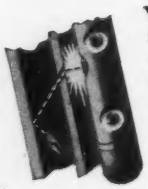

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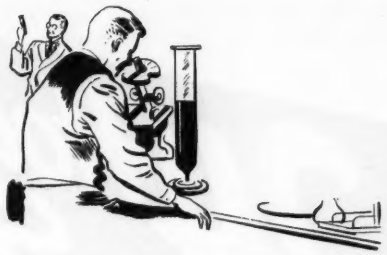
or some other such popular yet deceptive title, without regard for the general good of all, seeks to block any program with a view of procuring some undue advantage to himself. This group, however, is in reality extremely and surprisingly small and, although exasperating, is not the real problem.

Solving the Royalty Owner Problem

You ask the solution of the royalty owner problem? To me there is but one answer.

In respect of a pool which you propose to unitize, I would suggest a constructive program of education among those royalty owners who are readily available and have more than a whispering interest. I would urge their organization and take them into my confidence, advising them what is going on and what is to be accomplished. I would urge that as a group they employ a reputable, independent consultant. A well-informed and organized group of royalty owners with high-type consultants and representatives is much more satisfactory to work with than is an uninformed and disorganized group who, through lack of information and proper leadership, become obstructionists against their own best interests. In some of the newer and larger units, notably Cotton Valley and Erath, where the royalty owner was taken into the confidence of the operating interests and informed of the project, a minimum of difficulties and litigation has been encountered in respect of the royalty interests. The case of Crichton v. Lee, supra, was the complaint of only one royalty owner. Such complaints are few and far between. Why should not this be so? If the project is sound from an engineering standpoint it works to the advantage of the royalty owner. There should be nothing to hide.

Then, with respect to the royalty owner who, because of the smallness of his interest and inaccessibility from the standpoint of distance cannot be personally contacted; those who are dilatory in their response, and also the recalcitrant individual, the laws of Oklahoma and Louisiana, in particular, afford an adequate remedy, namely, that upon notice and hearing, giving to the royalty



owner every opportunity to be heard and voice his objection to the plan, the Commissions of those states have the authority to nevertheless authorize the adoption of the program, if fair and reasonable, and make it binding on the interests of such royalty owners to the same extent as if they had agreed. The case of Crichton v. Lee, to which I have already referred, was just such a case. The plaintiff, a royalty owner under a five-year commercial lease given prior to the adoption of the Cotton Valley unitization agreement, refused to ratify or approve the agreement. The Commission acting pursuant to the provision of the Louisiana act nevertheless, after notice and hearing approved the plan and authorized its adoption. Thereafter the initial or primary term of the lease in question expired without either the lessee or the unit drilling a well on plaintiff's land.

Plaintiff thus claimed that with the expiration of the five-year term, without a well having been drilled on his land in compliance with the express terms of his lease, the lease terminated. The court said "No"; that notwithstanding the terms of his lease and notwithstanding his refusal to agree to the pool unitization, he was bound by such program of unitization which made the development on the other parts of the unit area development of his land, thereby continuing his lease in force against his will.

Patterson vs Stanolind Oil Co.

Such also was the holding in the Oklahoma case of Patterson v. Stanolind Oil & Refining Company[7] with respect to the unitization resulting from the well spacing laws of Oklahoma. It involved the claim of a royalty owner who refused to consent to the enforced unitization of his land with other lands. Notwithstanding the terms of his lease and his refusal to agree to such unitization, the court enforced the sharing of the royalties from oil produced from his land with other owners in the unit.

The royalty owner, therefore, although a problem and should be dealt with where possible, educated and kept informed of what is going on, is not any real obstacle standing in the way of unitization. Enabling legislation is needed in most of the states, but in my opinion when the Industry can agree, from an operating viewpoint, proper legislation will be forthcoming.

What has been said with respect to the royalty owner applies with equal force to the owner of overriding royalties, carried interests, mortgages and various other contractual obligations constituting a charge against the lands, leases and production sought to be unitized. The problem is to work out a plan that is fair, just and reasonable in respect of these interests, or for the operator to see to it that these obligations are taken care of or discharged.

I, at the outset, made mention of problems that are "headaches". Strange as it may seem, these for the most part include not the problems heretofore touched on, namely, legal consideration or royalty owners, nor as much to recalcitrant operators, as they do to problems involving the selfish interests as between operators who profess a willingness to unitize, but who try the souls of men with a persistent failure to get down to business or a refusal to agree upon matters that are relatively minor in relation to the benefits to be derived by conceding a point here and there and speeding the day of unitization.

Fixing the Unit Boundary

For instance, where to fix the unit boundary. There will be the operator, fully recognizing the merits and benefits of the proposed plan of unitization, but who has leases along the edge which embrace questionable acreage and who will insist that the unit should be extended to take in such acreage, thereby increasing his percentage in the unit. An operator with limited acreage on the fairway will contend otherwise for the advantage he will gain. And so they argue, while all the time the

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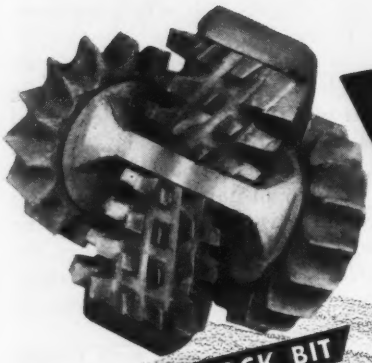

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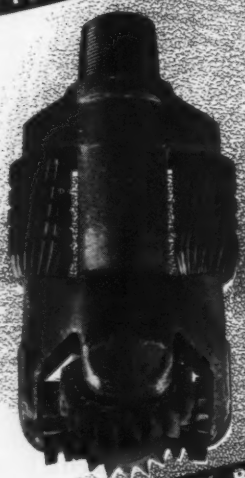

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geologists and engineers, if unshackled from the selfish interests of their companies, could, with a fair degree of accuracy, draw the line where from a scientific and operating standpoint the line should be drawn, letting the chips fall where they will. These arguments take time.

Allocating Production

Another problem of utmost intensity is that of the basis on which production is to be allocated and the division of interests to be arrived at. Every operator has his own personal view, depending upon his own peculiar position. Almost invariably an operator before expressing an opinion as to the scientific soundness of any formula will first inquire as to the percentage given him under the formula. If his wells are high ratio wells, he will insist on one formula. If on the flank, he will claim another. This is only natural, of course, yet if there is to be a pooling of interests, there must be a greater willingness to rely upon the best judgment of the geologist and engineer rather than purely selfish considerations. The average operator loses sight of the benefits lost through delay while arguing over some small difference in interest. Oftentimes the time spent in such arguments is as long as a year, 18 months, or two years. In the meantime, thousands of dollars are being spent in unnecessary wells, gas energy of untold value is wasted and other benefits of unitization dissipated. Those who want to unitize can get together on a formula, by way of example: At Erath, the division of interest is on the basis of hydrocarbons in place; in Cotton Valley, Lance Creek and Elk Basin acreage is the determining factor; Haynesville takes into account the productivity, acre feet and pressure. The proposal with respect to West Edmond is acre feet times pressure.

The proposed answer at West Edmond has taken months of hard work, many meetings and much discussion and it is still not finally agreed to.

Again, I believe that if engineers and geologists were left alone, they could and would, in a reasonably short time come out with a relatively fair answer; one that is as reasonably accurate as one arrived at after 18 months of nonscientific argument.

Who Operates The Unit?

Another problem is that of who shall operate the unit. Although this is usually resolved in favor of or perhaps I should say against the larger interest-holder in the unit, nevertheless it is usually the subject of time-consuming arguments. It is strange the extent to which an operator wants to go merely to satisfy his pride of operation. In truth and in fact, a unit operator gains no advantage. He does only what he is told to do by the operating committee of the unit or by some subcommittee to whom the operating committee delegates the task of directing operations. In all units that I know anything about, the accounting procedure is so set up that an operator is not permitted to make a profit on his operations. It is not intended that he should. His functions are purely mechanical. Yet, there are operators who say that they won't unitize unless they get the operation. In this same connection, it is not unusual to hear operators say "we are willing to unitize but insist upon retaining the operation of our own properties". This, of course, means that they do not want to unitize because the unitized operation of the unit is the antithesis of the individual operation of the several properties by the several operators. Companies who have had any experience at all with unitization discourage the splitting of any part of the operation among more than one operator except only in the case of the separate operation of a gasoline or repressuring plant. The only efficient and proper method of operating a unit is to charge one capable operator with the entire responsibility, subject of course to the direction of the group through the operating or advisory committees.

Adjustment of Initial Investment

Another problem that oftentimes presents some difficulty is that of the adjustment of the initial investment. As a rule, no two wells cost the same. They are drilled to different depths under different conditions, cased and equipped differently. Regardless of the difference in cost for each of the several wells, such difference does not reflect itself in the value of the well to the unit. Many of the most costly wells have no value at all to the unit because the unit under unitized operation may immediately shut in and not produce such wells. In the Schuler Unit in Arkansas, at least 50% of the wells in the field were shut in the day following the taking over of operations of the unit. This matter of adjusting the initial investment is truly a give and take proposition. Very little science is involved. It has been solved in a number of different ways. In some units the operator was allowed no credit for his intangible drilling cost and is paid only on the basis of well equipment, including the casing in the hole. Other plans adopt the same basis except that they include the casing with the hole and only pay the operator the value of his surface equipment. Some units have taken all wells in on the basis of a uniform valuation. In some units which embrace undeveloped acreage, the lessee of an undeveloped lease is permitted to either drill and present the units with a completed well or to pay the unit the amount that it would then cost such lessee to drill the same.

Taking Over Field Equipment

The taking over of lines, tank batteries and other equipment, aside from the wells, as a rule presents no particular problem. The unit selects the lines, tank batteries, etc. that it needs, paying therefor for a value arrived at in accordance with standard accounting procedure. Equipment not so taken over is then reclaimed by the separate owner and either sold by him in the open mar-

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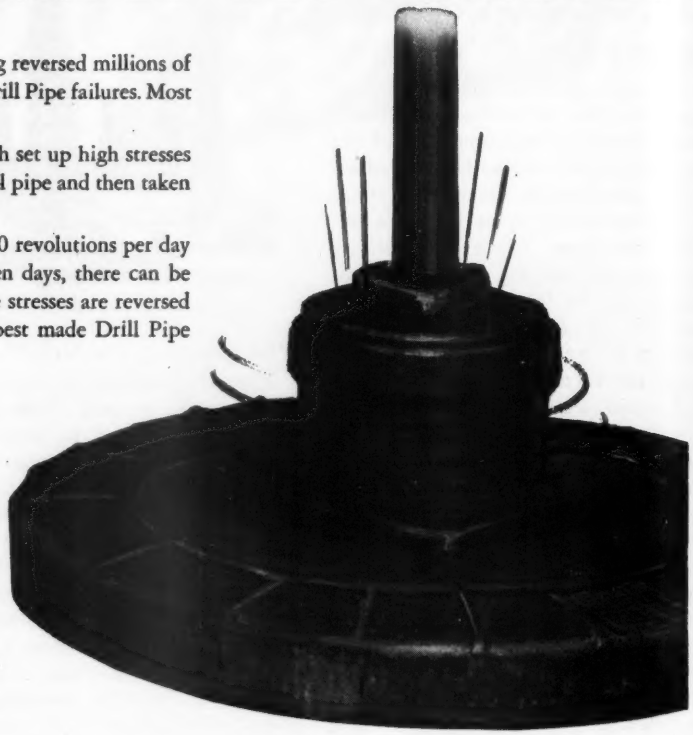

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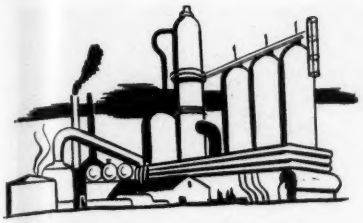


ket or transferred by such operator to other fields of operation.

Taking Over The Natural Gasoline Plant

One of the knottiest of all the problems in connection with the unitization of a field in which one or more natural gasoline plants have been built is the disposition to be made of the plants. The natural gasoline plant operator, having risked several million dollars in the construction of such a plant, feels that he is entitled to protection in his investment. There can be no question but that he should be protected. The question arises as to how. There is always a difference of opinion as to whether the plant profits or loses by unitization and the return of gas to the horizon. The overall volume passing through the plant may be increased or decreased, but in many instances an increase is offset by a reduction in the gasoline content. Because of these variables, it is thought by some that the plant should be taken over and included as a part of the unit operation. There are those who are not as enthusiastic about the natural gasoline business as others who do not want to increase the capital investment of the unit to that extent. If taken over, the question arises as to the basis on which the acquisition is to be made. I can see no other conclusion than that of the fair appraisal value of the plant as a going business, taking into account the present worth of the profits that would have been made by such a plant in the absence of unitization. Such valuation should not take into account any additional benefits that might have been made by reason of the unitization, nor is it fair to ask such a plant owner to surrender his plant, its reserves and its value as a going business on simply a material value or replacement cost basis. Unless the plant is so acquired, another alternative would be for the plant owner to enter into a revised casinghead gas or processing contract with the unit, making provision for the return and perhaps the compression of the residue for injection purposes on some reasonable basis that will afford to the plant owner a fair return on his investment, yet not profit unduly by unitization. Time would not permit discussion of all of the ramifications in this regard which are many as you can well suppose. Like many of the other problems of unitization, the problems with respect to the gasoline plant, are made more difficult because of the lack of knowledge of so many with respect to the natural gasoline business. They fail to take into account the tremendous risk in investment and other costs and hazards incident to such an operation.

Voting Power and Other Problems

There are, of course, a multitude of other problems to be dealt with and considered in connection with any program of unitization. For instance, the voting power in the unit, the call on the production, accounting, financing the operator who is unable to finance himself and others. But the answer to most of these problems has become more or less standardized so as not to cause any particular difficulty. The usual procedure is for each operator to have a vote in proportion to his interest. Sometimes a vote is cast by each operator having a representative on the operating committee. In other units a smaller operating committee is provided for, with provision being made for one representative on the committee to represent a number of the operators. The matter of financing the smaller operators has not proved difficult. As a rule, the major interests are able to work out a fair arrangement in this regard. Of late, the banks, because of the security afforded by a field-wide plan of unitization, have shown a keen interest in underwriting the expense.

Conclusions

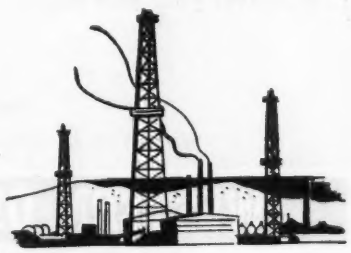
In conclusion, there is a constructive suggestion with respect to procedure which I would like to offer and which to my mind would minimize the time and problems involved in the unitization of an oil pool.

First, in respect of any pool in which unitization is considered desirable the geologists, engineers and other technologists should be permitted to make a study of the problem purely from a scientific viewpoint, unhampered by any selfish company interest. Let the scientists determine the area to be included; the amount of additional recovery to be had and the proper division of interests between tracts. I have a great respect for the ability of the geologists and engineers in this regard. They will come out with a fair answer.

I would leave out of this first step any discussion of who shall operate the unit, matters of accounting procedure, on what basis equipment is to be taken over, voting power and the like, which are not engineering problems and merely confuse the early issues to be decided. I have heard hours of discussion on these questions early in the negotiation by representatives without the slightest knowledge of what their companies may ultimately desire. Such matters are not matters of engineering but of policy to be decided after the engineer has completed his work.

Just as soon then as the engineering report is complete, there should be a most active interest on the part of the "top hands" of the interested companies through their personal participation in the early negotiations. Unitization of a pool such as West Edmond, Erath, Elk Basin and others is big business. It deserves the attention of members of the Management with authority to speak for the companies. It is with no discredit to the profession or personal ability of a representative who does not have authority to speak for a company to say that

(Continued on Page 55)



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COMPLETE PIPE SERVICE, promptly handled by experts has earned for WOSCO its enviable reputation for dependable service to the oil industry during the past decade. The repair and reconditioning of used pipe and the storage and preparation of new pipe for oilfield use are but a few of many services available at Wosco.

WOSCO: **Supplies** pipe for every oilfield need
Repairs and reconditions used pipe
Manufactures oilfield conductor pipe
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Whatever your pipe needs . . . WOSCO DOES IT!

Wosco sleeving saves you money, makes used pipe good as new. The finest of materials, skilled workmanship and years of experience go into every sleeving job. Complete shop facilities assure quick, expert service at Wosco.

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WESTERN OILFIELDS SUPPLY CO.

Kern County OIL NEWS

THREE TIMES IN AS MANY MONTHS we have heard praises being sung about the "wonderful gentlemen's agreement" as regards production and the "**mers**" . . . . While national, state and valley men in Kern County were blowing this kind of smoke up brass helmets, **three areas,** two in San Joaquin Valley, were **overproducing.**

ONE FIELD IN CONFERENCE with "mer's" engineers, and their own are at variance as to the interpretation of the curtailed practice, but the other two fields, one in Kern County, the other down South are deliberately **"pushing 'em up."**

IF THERE IS ANYTHING we can say or do to help bad boys be good boys, kindly let us know. With 88 million barrels on hand, with a possible normal working level of, say 100 million barrels by year's end; **"going to storage"** is still not too far off. Someone said we were **"overing"** 50 thousand barrels a day in California.

WELL SOME OF THE OIL BOYS up here are grumbling a bit . . . reaction **"sets-in"** rapidly and some of the **"back-talk"** about prices for crude offered by purchasing agents, is as they say in some parlance, reverberating.

AS YOU MAY WELL KNOW gasoline at the pumps is worth more. Some think this was called to Senator Collier's attention, too . . . and of course the price of crude in the **"Midcontinent"** is firmed up a point or two. So with the West's production costs up just a little anyway over other areas, looks like some of the operators were in rightful possession of a "beef."

TAXPERTS WHO ARE SIGNS OF SPRING and their accompanying budget shopping, are as good looking as ever, but the wildflowers, also other signs of spring, are not so good looking. Even the "poppy-runs" to the derricks around potato fields which get some moisture, are shortstemmed and scarce.

GENERAL "HAP" ARNOLD WAS IN TOWN on Fish and Game business this month and we couldn't help but notice the number of oilwigs who were **"shooting the ducks with him."** One thing certain about the visit, Hap was not on foreign ground, however, the last time here he was doing less talking but more hunting. That was on December 7 way back "yonder" in '41, early one morning; but in that afternoon he found bigger new game—and started shooting in another direction.

MAX SHAFFRATH, formerly with SOCO at Coalinga and Kern River, came down from Berkeley one day this month and seemed more active than ever, since his retirement almost a decade ago. Mrs. Max was with him and visited old friends of the area at various civic and service organization meetings where Max was always seen.

WEDDING BELLS RANG recently for Miss Marie Anderson of the local general offices of Standard. Attorney Glenn Bultman, of Dorsey, Campbell and Bultman helped listen to the peeling. After a brief runaway from friends they returned (as they always do), and settled down to identify themselves with society and the struggle for the higher-standards of life and a better existence. Glenn is joining the Chamber of Commerce.

OF CONSIDERABLE INTEREST TO oil people was the County Commerce Convention which made some recommendations to the civic leaders of Kern as to the picture ahead, and how civic organizations might aid in pointing up the program for the industry's needs. **Barney Bernard** of the Conservation office here, gave a very excellent **paper on the future of Kern oil** . . . not too rosy as regards new fields and such sources. **R. D. PATTERSON** of Shell Company gave a story on "wildcats," their costs, their need and the small results. **PAUL J. HOWARD** was in charge of the panel and his good wife Helen Howard took down the notes.

SAN JOAQUIN VALLEY OIL PRODUCERS retain Allen A. Jergins as President shown in center. Max W. Ball, (right) director of the oil and gas division of the Department of the Interior shared the spotlight with Colonel O. F. Kotick of the army-navy petroleum board, a Kern County boy who made good.

A MOTION PICTURE BY NAME, "The Golden Empire of Kern" has been receiving some extra attention all over the country. Oil seems to be the big sound, color and background theme. However, oil is no longer the top cash income vehicle, and for the second time in this century 1943 and 1946 farm returns have exceeded income from petroleum.

KERN COUNTY OIL last year rang up cash registers to the tune of $118 millions. The increase in 1946 price just about offsets the loss or curtailment and lack of sufficient new fields or new oil sources. But when you add about $10 million from mines the income still is down from farm totals.

FARM INCOME TALLY went to over $140 millions this year for Kern County, to make it third in the state and in the nation to help California nose out Iowa again, in the total agricultural wealth of any one state in the union. Iowa has had the record for nigh on to a half century, plus.

SERIOUS YOUNG MAN: Doyle Graves, who resigned from San Joaquin Valley Oil Scouts Association, has joined Western Gulf Oil Company. Formerly he was with Amerada. Drillers, Operators, Scouts, Geologists and others will miss his chairmanship at the headtable on Wednesdays.

SADDENED THIS MONTH were many friends of **CHARLES E. MANLEY** who lost his aged father **JOHN S. MANLEY.** We knew him quite well and admired him for the fact that his son had inherited so many of his fine characteristics. Incidentally, Charlie has been real busy lately with the Kellogg & Sons project and with Continental down south of Bakersfield, and Oilfields Construction Company has another sizable purchase order to do business with these folks, . . . **it seems to us.** Meanwhile Charles finds time to put in a couple husky licks here and there with civic organizations in helping make Kern County a better place in which to live. He and his brothers also help Tiny's Cafe to become a better place in which to eat.

RAIN WHICH FAILED TO COME the early part of the season could not do much good if it came now. Oil doesn't need it, and the things which do, have passed their prime. Perhaps Petroleum will invent a good stock food instead someday?

THE MAN IN THE FIELD
knows the importance of a
Dependable VALVE

SPECIALIZING in
STELLITING of PLUG VALVES
Known for repair and sale of
oil well and refinery valves.
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25 *Years*

Celebrating a Quarter
of a Century of Service
to Oil Men and the
Oil Industry

SILVER ANNIVERSARY YEAR
KERN COUNTY
BANK
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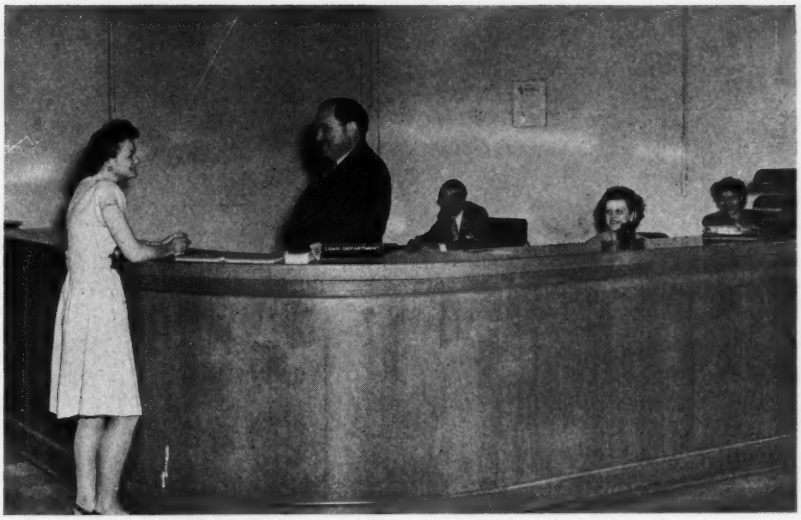
MEMBER FEDERAL DEPOSIT INSURANCE CORPORATION

EXCEPT ON OCCASION, at Stockdale after the 19th hole, and the time when community affairs are most concerned with cultural values which attract industry, Charley Lake is a man of a very few words. Recently, however, there was an occasion and what he said about Living Memorials from civic works programs will long be remembered here by the survivors of the heroic World War II veterans. His forthright contribution before the 482 delegates at the recent Conference on Community Needs has caused the initiation of a Living Memorials Association embracing 77 communities which will have a stake in building vehicles that attract industry and promulgate commerce. The stimulation of existing farm and oil industry economy will do much to firm up their constancy. Many public services are needed to encourage new commerce, according to Charles P. Lake of the Western Oilfields Supply Company.



KERN COUNTY'S BANK'S Vice President and General Manager Harry J. Crossan demonstrates how to say "no" when not making a loan. Everyone seems happy just the same as KCB celebrates its Silver Anniversary this fall. Plans are being made to observe November 22, 1922 birthday. Other members of the staff are W. A. Coleman, Elizabeth Day and Shirley Belveal from left to right. There are sixteen others to make up the total personnel.

YOUR LATEST CONTRIBUTOR to Kern County Oil News is **KERN COUNTY BANK.** This year the independent financial institution celebrates its silver anniversary. Exact birthday, November 22, 1922. It was born in the first "oilstrike" year of the industry, at Taft. The branch office at Oildale is five times larger than its H/Q at Taft. It has lived through two or three depressions according to H. F. (Fred) Owen of Ethel "D" Oil Company, its presi-

Dependable, Low-cost Conveyance for OIL and GAS

HIGH FLOW CAPACITY

is one advantage of Calco Welded Steel Pipe . . . Calco Welded Steel Pipe is smooth inside and shows little evidence of ridges, creases or other obstructions that tend to retard the flow of gas and oil in pipe lines. Uniform wall thickness, long easily-handled lengths, and light weight are some of the other advantages you will find in Calco Welded Steel Pipe.

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CALCO DIVISION

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MEN and ROPE

Tony Camilleri, 34 years with Tubbs Cordage Company, operates the modern Gill fiber spinner.

In every stage of rope making there must be MEN—men skilled in operating precision machines, men to check each step in manufacture, to assure a finished rope product that will deliver the maximum in wear and dependability. It is this combination of MEN and ROPE in the Tubbs mills that assures you EXTRA rope value when you specify TUBBS to your supplier.

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TUBBS CORDAGE COMPANY

Mills in San Francisco
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dent, who is a great friend of Angus Crites. Recently Angus reported that Kern County Bank with its $12 millions is exactly the same size of his brother's bank, the old Security Trust and Savings that Arthur S. Crites headed up back in 1922.

GOING BACK TO THE COUNTY COMMERCE CONVENTION which voted among other things to recommend that a County Industrial Engineer be engaged to assist Oil and **AGRICULTURAL** in **MANUFACTURING** items from their products . . . **WHAT DO YOU THINK?**

SEEPAGE DRILLING, Accidental Drilling and miscellaneous punching of holes, were some of the topics which R. D. (Andy) Anderson of Shell briefed at the recent Commerce Convention. Paul J. Howard, Chairman, told the conclave that the first paying well was drilled at McKittrick in 1898 . . . Kern River 1899 . . . Maricopa 1900. Anderson named the areas of most importance now being developed. Caliente Basin, Cymric Area, Santiago Creek, Elk Hills Anticline and Grapevine Tejon.

ANY DEVELOPMENT OF FIELDS UNDER VALLEY FLOOR would be pretty expensive according to Patterson of Shell.

OH YES! lest we fumble the ball . . . Owen Johnson . . . Johnson Valve . . . just discovered his new telephone number . . . you see he sold his Cresta home for twice what he paid for it and four times what it was worth . . . (We ought to know we live here) and he has a special phone number down at the Bakersfield Inn. (don't look now but it is 2-1634).

TRANSFERRED: Jim Millhauser to Bakersfield office of Ohio Oil Company, from Los Angeles facility and the U. S. Army, especially.

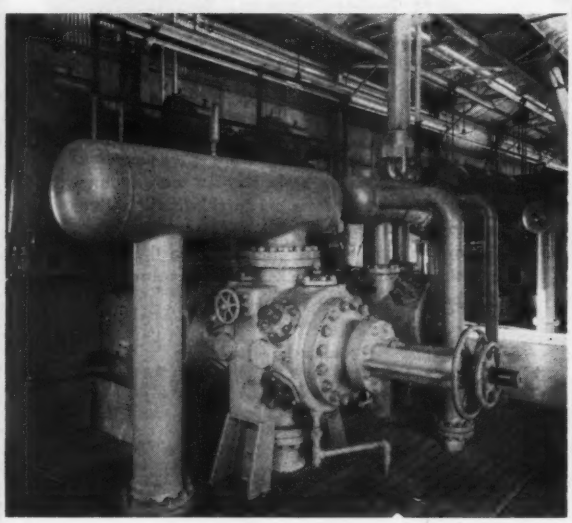
WEDDING BELLS CHIMED AGAIN FOR OIL people and from Western Gulf to the altar came **MELVIN HILL** to meet **DAPHNE LANGSTON** of Richfield . . . where they were summarily **ONE.**

DOYLE GRAVES from Amerada went to Western Gulf . . . all of a sudden but to no one's surprise (in general). However, this amiable, likeable Graves was once head of the "Oil Scouts" Association.

YOU KNOW THIS GENE POWELL is not a bad person at that . . . despite the fact he had no definite plan to help oilwigs protect their homes from bad sewage and all that sort of thing; he was a very careful listener . . . listener to all things political and economic . . . We look to him for leadership on "Oilwig Hill' . . . and we feel certain that he will have a plan.

SPEAKING OF JOHNSON VALVE and we do this everytime . . . it's a trick son . . . but Lou Shaeffer, valve specialist . . . in fact an engineer . . . perhaps a valve engineer too . . . must have been . . . because he was once with Walworth Valve Co. . . . where you have to be good or else . . . well he is now associated with Owen Johnson . . . incidentally Owen said he had the best month he ever had by over $2000.00 and when we challenged him on "account of advertising in COW" . . . he said, "well . . . we are not going to deny that . . . especially if it does you any good . . . because we can't find out any other reason ourselves."

OIL FIELD CONSTRUCTION CO.
of Bakersfield
Boiler Plants and Insulation Brick and Structural Steel Work
Compressor Plant Construction
Johns-Manville
INDUSTRIAL INSULATION
C. E. MANLEY, Manager
Highway 99, West of Circle — Phone 30750



GOODALL ROTARY HOSE
with BARNEY COUPLING
BEST FOR DRILLING regardless of formations, depth or pump pressures; Goodall "Long Life" Rotary Hose is constructed of finest rubber and heavy duck plies reinforced with high tensile steel wire. It's a rugged, abrasive resistant hose that resists outward pressure and elongation.
BARNEY COUPLING— An integral part of the Goodall Rotary Hose eliminates clamps, stems, and metal from bore of hose, thereby removing cause of most rotary hose failures. Do away with high pressure leaks; order Goodall Rotary Hose with Barney Coupling
OTHER GOODALL — PRODUCTS
All Types Industrial Rubber Goods plus Steam, Suction, Fuel, Discharge, Cement and Flue Cleaner Hoses.
GOODALL RUBBER CO.
LOS ANGELES • SEATTLE
• SALT LAKE CITY • SAN FRANCISCO

(EDITOR'S NOTE . . . . this is a true story; he thinks the ad did it so help us Providence).

OUR GOOD FRIEND Carl Bray has been suffering a painful plural condition but he is thought to be improved . . . we called his home and his father, careful to interpret our call was more than gracious in telling us about Carl who is a well liked and well known oilwell suppy accountant.

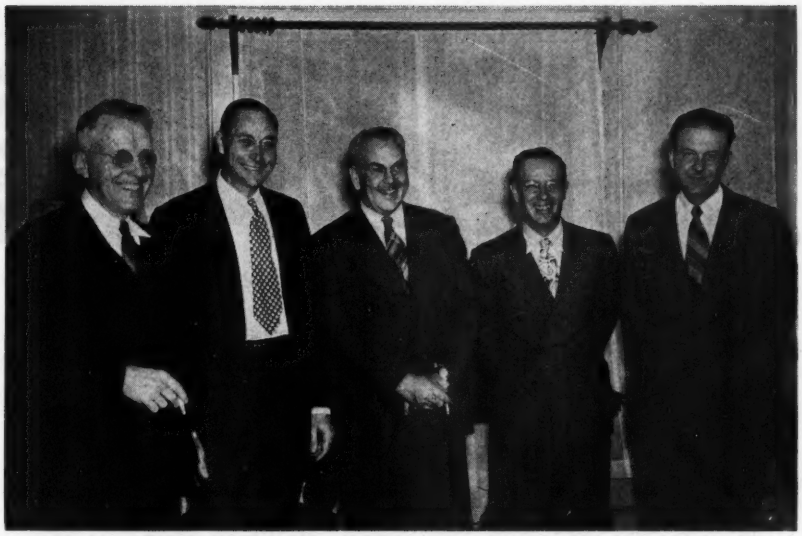
OILSCOUTS WHO MEET here every Wednesday were handed a news survey quesetionnaire, but when their meeting was over we had too much scouting dope. What we wanted was a little social engineering and gossip; like births, weddings, transfers, trips or golf, sick or hurt, lost or found, retired or retreaded, promotion or hobby. Even a new car is news.

HOWEVER, SOME OF THE information might be in good review at this time and it is sent along . . . for whatever it is worth.

JUST TO SHOW FOLKS IN THE OIL that Oil Golf Association is not the only thing of its kind, the potatowigs and wags formed their own Potato Golf Association and the stakes were nice and high. Spuds a $30 million income will now have their place in the warm sun at Stockdale as a prelude to the Annual Meeting and Banquet of the Potato Growers Association.

ANNUAL MEETING OF SAN JOAQUIN VALLEY Oil Producers recorded as best one of its kind. A fuel crisis in future war not at all probable but very possible. Colonel O. F. Kotick of the army-navy petroleum board Washington, D. C., pulled no punches and he was not guessing. While Max W. Ball, the new director of oil and gas division of the U. S. Department of Interior, was a most excellent speaker and kept his audience in a fine fettle, Colonel Kotick really gave the sizzle of the evening which pricked our mind and conscience.

IN ORDER TO DEVELOP oil reserves for any great need it behooves America to develop or explore sources for oil throughout the western hemisphere, according to Colonel Kotick, a Kern County boy. Oilmen were also urged to develop foreign holdings without commercial risks being assumed. By 1950 Russia will have 20,000 bbls. a day of synthetic gasoline, ours will be about 7000 barrels . . . according to Kotick.



SJVOPA OFFICERS FOR 1947: Charles O. Premo, Secretary; Gene Reid, R. E. (Pete) Gignoux, J. B. Spellacy, and R. E. McCarthy, directors of the San Joaquin Valley Oil Producers Association. Pete Gignoux is from Hopper Machine Works and R. E. (Bob) McCarthy heads up McCarthy Tank. Other directors not shown in picture are: A. A. Jergins, president, H. F. Owen, vice president, W. C. Whaley also a vice president. Other elected board members are W. M. Keck, Jr., C. C. Spicer, Harold R. Pauley, Richard Fenton, Chas. Prewett, V. P. Baker and L. L. Aubert. The annual meeting was held at El Tejon Hotel, Bakersfield.

Johnston Stainless Welding Rods

PROVEN QUALITY SINCE 1931

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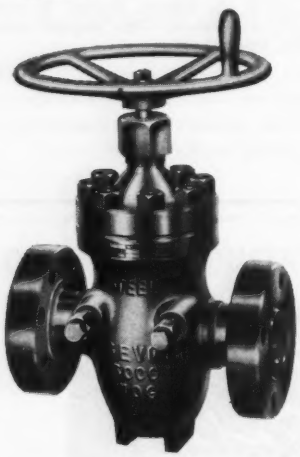
A. P. JOHNSTON

1845 E. 57th St. - Los Angeles 11, Calif.

McEvoy Announces New Oil Field Valve

A new conduit gate valve, especially designed for high pressure oil field service, has been announced by the McEvoy Company of Houston.

Features include an automatic lubrication system that continuously protects the valve from leaks. The system is arranged so lubricant is automatically injected from a reservoir to the sealing area whenever it is needed.



Other features include non-distorting seats, gate valves that automatically align themselves to the undistorted seats, and hard chrome plated sealing surfaces.

The manufacturer reports that early models of these valves have been giving sensational service under difficult conditions for many oil companies. They have been used successfully on distillate wells and high temperature, very corrosive wells.

In view of this service, the manufacturer has decided to offer the valve with a one year guarantee. This guarantee offers free repair of any valve that needs service within one year of the time it is shipped from the plant.

The McEvoy Valve is offered in four sizes: 2", 2½", 3" and 4" and in 5000 lb., 3000 lb., and 2000 lb. W.O.G. working pressures. It is available in either the standard model with chrome plated stem and sealing surfaces or the all stainless model for severe corrosive conditions.

Further information may be obtain from McEvoy Company, P. O. Box 3127, Houston 1, Texas.

Kontol Corrosion Preventives

The Tretolite Company, St. Louis 19, Missouri, announces the development of a new class of reagents for the prevention of corrosion of oil and gas well equipment. Designated as "Kontol Corrosion Preventives," these inhibitors have been shown by laboratory and field testing to be effective in materially reducing corrosion in either pumping or condensate wells.

Prior to 1942 the corrosion of condensate well equipment was virtually unrecognized, but lately it has assumed a position of major importance in the economics of condensate well operation. Recent experience indicates that with wells produced at pressures above 1500 psi and at reservoir temperatures above 160°F., corrosion may be serious if more than 0.2% CO_2 by volume is present. Extensive field testing has proven Kontol 115 Corrosion Preventive to be especially effective in inhibiting corrosion in these wells.

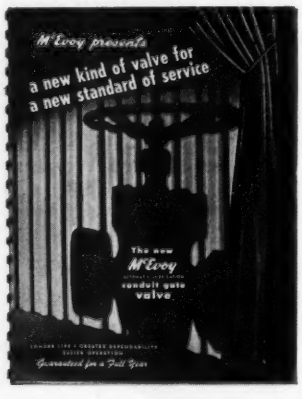
Kontol 115 is a non-toxic, oil soluble, nearly odorless liquid which readily lends itself to well treatment. There is no tendency toward plugging of either the formation or well tubing by its use, since Kontol 115 does not show any reaction with salts carried by the brine, nor does it raise the pH of the brine with the possible resultant deposition of calcium or magnesium scales. Although oil soluble, Kontol 115 is surface active and builds up a thin film on the metal surface which protects the metal from corrosive elements in either brine or condensate. Since it is a concentrated inhibitor, only small volumes of Kontol 115 are required to maintain this film, and thereby effectively inhibit the corrosion of well equipment.

Kontol 115 is now being employed commercially by various producers with good results, and with no harmful effects becoming apparent after approximately a year's continuous use.

McEvoy Company Offers New Valve Catalog

The McEvoy Company of Houston is offering a 20 page catalog describing their new automatic lubrication Conduit Gate Valve for oil field service.

The catalog includes vividly illustrated descriptions of the principle features of the new valve. These illustrations use three colors to increase the clarity of the explanations.



Complete specifications, a concise report on the performance of the valves, and a full color cutaway drawing are also included.

The catalog will be mailed to any interested person. McEvoy Company, P.O. Box 3127, Houston 1, Texas.

New Emsco JV Series Oil Field Swivels

The manufacture of a new series of oil field swivels has been announced by Emsco Derrick & Equipment Co. of Los Angeles, California. These new swivels, known as the Emsco JV Series, incorporate all Emsco field-proven and time-tested design features, plus numerous new and exclusive improvements developed through extensive research and long experience in the manufacturing of oil field drilling equipment.

Designed for medium and deep drilling the new Emsco JV Swivels are available in three types—JV-7, JV-9 and JV-12.

Several totally-new and unusual design features have been incorporated in the new Emsco JV Series of Swivels. Outstanding among these are: a two-piece, demountable, steel bail; simplified hose connection permitting packing replacement without disconnecting hose; venturi-type wash pipe and sleeve; cartridge-style wash pipe packing; and maximum vertical spacing at radial roller bearing which maintain positive alignment of sleeve and packing assembly with wash pipe. Each of these important new features is illustrated and fully described below.

New Emsco Two-Piece Bail

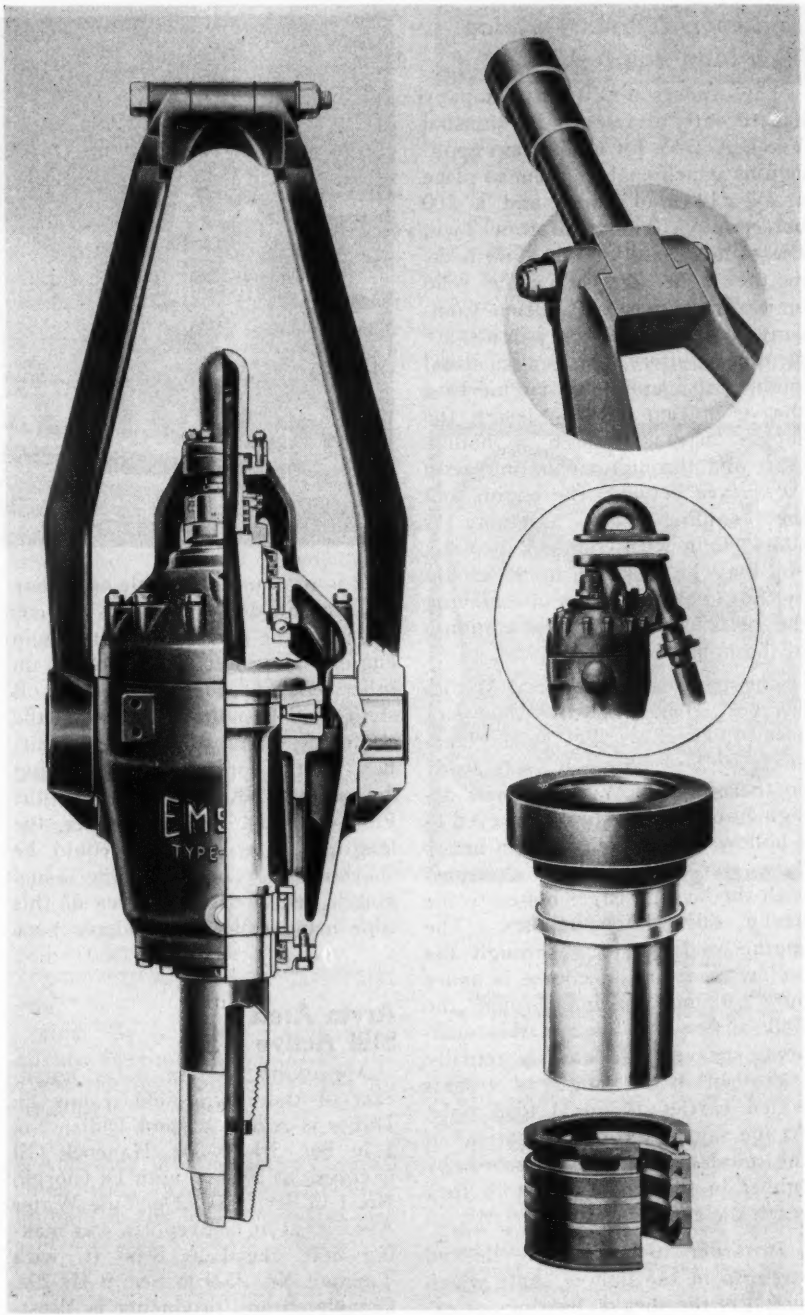
All JV Swivels have the new Emsco demountable steel bail. This bail can be readily converted from the conventional or hook type to that using the elevator shank as clearly shown in the acompanying illustration.

The tapered design of the bail arms distributes load stresses equally. Easy removal of bail arms permits field repair and assembly. Due to precision design, close trunnion fitting is possible, eliminating excessive wear between trunnions and bail.

A conventional, one-piece, forged-steel bail is also available as optional equipment if desired.

Simplified Hose Connection

The new style gooseneck is so designed that its removal does not necessitate uncoupling of the mud hose. See illustration. This gooseneck design permits easy replacement of wash pipe packing without disconnecting hose.



Venturi-Type Wash Pipe and Sleeve

The fluid channel through wash pipe and sleeve assembly, see cut-away illustration of swivel, is designed to afford a venturi type passageway. This considerably increases life of wash pipe packing by inducing a high velocity, low pressure area adjacent to packing.

Cartridge-Type Wash Pipe Packing

A special, factory assembled cartridge-style packing has been developed for use with Emsco JV Series Swivels. This new packing is so designed that the sealing lip of each ring acts free and independently from the others (see cut-away view of packing)—all pressure being absorbed by the solid outer portion of the ring rather than compressing entire packing. Being factory assembled in cartridge form and designed to prevent improper installation, this new wash pipe packing eliminates all replacement difficulties.

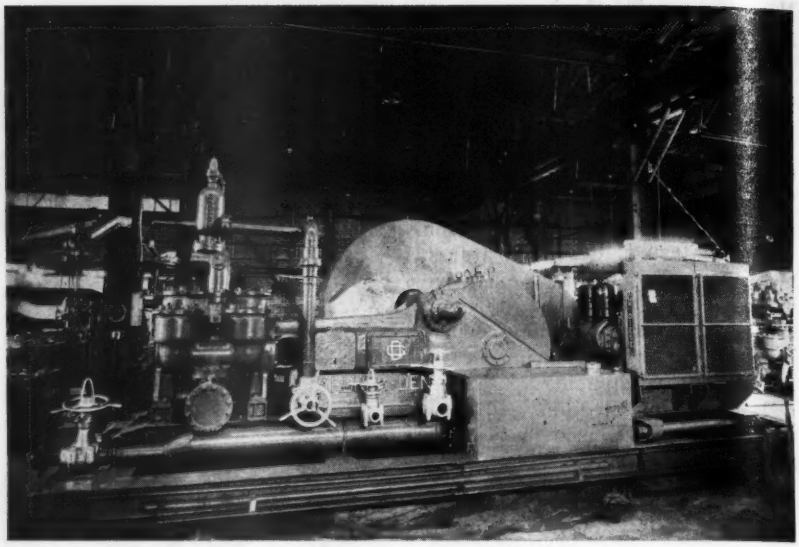
Anderson-O'Brien Develop New Mud Pump Drive

The Anderson-O'Brien Company has recently developed an unusual Vee belt drive for mud pump applications which enables them to place a 7¼ x 14 mud pump and a 260 horsepower General Motors Twin Diesel Engine all on one skid, within the eight foot allowable road limit. The Anderson-O'Brien Company design, on which patents are pending, differs from the usual method of coupling an engine to a sheave in that in this design the engine drives through a hollow shaft and through a coupling, with the sheave between the engine and the coupling. The assembly is 102½" long with coupling in place, but may be reduced to 96 inches by the simple expedient of removing the bolts which hold the coupling to the hubs of the shafts.

The design of the General Motors Twin Engine gear case does not permit placing a pulley on the take-off shaft and taking a "side load" on the bearings. With this new design, however, the sheave is keyed to a hollow shaft which rides in heavy duty self-aligning SKF bearings with the bearing cages bolted to the heavy side plate supports. The engine shaft projects through the hollow shaft and of course is under pure torsional loading through the Falk airflex coupling. In this manner a sheave "side load" is actually taken within the length of a shaft which carries torsional load only. At the same time, the pulsations of the mud pump are absorbed by rubber in the coupling before they reach the engine shaft.

In order to secure the desired strength in the hollow shaft which supports the sheave, bearings of exceptionally large diameter, 230 mm., were employed. These are lubricated by Alemite fittings and provided with an overflow to prevent "hydraulicing" the bearing. "Perfect" oil seals, spring loaded leather type, retain the grease within the bearing cages.

The sheave is of 20 inch P. D. and provided with 12 grooves to carry the 296 maximum horsepower output of the General Motors Twin Diesel at 900 R.P.M. shaft speed.



It is of course, possible to utilize any engine drive with this device. Whereas the General Motors Twin engine has built in clutches, on other engines the power take-off shaft may be bolted directly to the engine flywheel and a Fawick airflex clutch or similar clutching device may be used instead of the Falk coupling. In this manner, the length of the assembly could be shortened by omitting the usual clutch belt housing. Drives of this type using roller chains have been developed by the Anderson-O'Brien Company for use on drawworks and will be announced in the near future.

The Brown Drilling Company, who has purchased the first unit pictured here, will place the equipment in operation in the Bakersfield area within the next few weeks.

The Engineering Products Company built the unit under the Anderson-O'Brien designs, and the Republic Supply Company of California mounted the equipment.

Arvin Area Still Active

Approximately six miles northeast of the Arvin field, Louis H. Didier is ready to spud Didier No. 1 in Sec. 10-31s-30e. Hancock Oil is coring at 5958 ft. with Di Giorgio No. 1 in Sec. 4-31s-29e. Tide Water Associated at last reports was making hole ahead at 8666 ft. with Tupman No. 23-9 in Sec. 9-31s-29e. Completed and producing is Western Gulf's Di Giorgio No. 1 in Sec. 10. It is rated at 85 barrels of oil and 102,000 cubic ft. of gas a day from an effective depth of 6504 ft. Barnes & Shadrick have spudded Barlow No. 2 in Sec. 30-31s-30e.

Sand Hill Try Drills

In the Sand Hill area of Kern County, Western Gulf is prospecting at 4784 ft. with S. P. No. 1 in Sec. 25-12n-20w. The company is rigging pump to K. T. Case No. 1 in Sec. 23-11n-23w in the Santiago area. The well was plugged back from 3826 ft. to 3200 ft.

Kettleman Hills Try May Be Killed

Indications are Standard of California may kill its No. 73-30V in Sec. 30-23s-19e in the Middle Dome area of Kettleman Hills and start fishing for balance of drill pipe near bottom at 12,389 ft. The company's No. 213-35A in Sec. 35-19s-15e is pumping water from a plugged depth of 2935 ft.

Ten Section Test Deeper

Shell Oil is keeping on with the drill below 12,700 ft. in KCL-A No. 53-30 in Sec. 30-30s-26e in the Ten Section area.

THIS LAUGH

OFF!!

Ed was limping badly. "What's up?" asked Bill. "Hurt yourself?"

"No, got a nail in my foot," replied Ed.

"Why don't you take it out?" asked Bill.

"What! On my lunch hour!"

Navy Wife: "When we were first married you said I had a shape like a beautiful ship."

Husband: "Yeah, but your cargo has shifted."

The Termite's nightmare: I dreamt I dwelled in marble halls.

Nothing so raises us men's morale
As a gaze at the knees of a shapely gal;
Let's keep in sight those dimples we love
For well we know. . . . Oh, Heavens above.

Once upon a time there was a young couple about to be married. She was concentrating on her trousseau and he was concentrating on her torso . . . and that's why her trousseau got torso!

Gert: I was getting found of Ed . . . until he got fresh and spoiled everything.

Myrt: Isn't it terrible how fast a man can undo everything?

Johnny: Daddy, what is your birthstone?

Daddy: A grindstone, son.

Doctor: How is Dotson doing this morning?

Nurse: I think he's regaining consciousness. He tried to blow foam off his medicine.

Did you hear about the moron who dipped his finger in the gasoline and exclaimed. "This doen't feel like ethyl-"

Wife to husband who has had a few drinks too many: "No, I can't forgive you, Archibald. This is the end. If this were the first time it would be different, but you came home in the same condition in November, 1918."

A cute young thing walked into a dress shop and asked to see some silk dresses. The saleslady tried to convince her that she should buy a wool dress, but to no avail. Finally she asked, "But why do you insist on a silk dress?"

"I'm tired of having the wool pulled over my eyes!"

Boss: "My wife heard I took you out to dinner the other evening."

Secretary. "Well, what does that make me?"

Boss: "That makes you my ex-secretary."

Joe: "You look very downcast."

Jim: "Yes, my wife has been away for six weeks, and she's just come back."

Joe: "Why should that worry you?"

Jim: "Well, I told her I spent all my evenings at home—and tonight the light bill came. It's for 50 cents."

And then there was the cannibal chief who, when his tribesmen brought in the beautiful white girl, said: "I think I'll have breakfast in bed this morning!"

"Where did you get that black eye?"

"I went to a dance last night and was struck by the beauty of the place."

Baby ear of corn: "Where did I tum from, Mummy?"

Mama ear of corn: "The stalk brought you, dear."

One look at the brassiere ads is enough to convince one that honesty is no longer the bust policy.

"I'll bet she wouldn't marry me," he said. She called his bet and raised him five.

A noted physician says the best reducing system is described in four words: " No more, thank you."

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Sometimes we get lazy. That's when we start neglecting our friends by not going to see them.

Otherwise we see them only when their Jensen pumping units need fixin'—and that's not often enough to keep a good friendship alive.

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OR CONTINUOUS CORING

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The Protrusion Regulator Spring permits retraction of the core barrel cutter head within the drilling bit when coring hard formations, protecting the head from too much weight.

In the soft formations the Spring permits the Cutter Head to core ahead, keeping the core from being broken up by the bit or washed away by slush action.

The Core Barrel Cutter Heads are hard faced with "Reedite" and are replaceable, assuring maximum cutting action at all times while coring.

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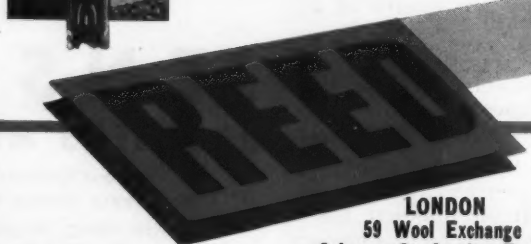

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Field Development

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Los Angeles Basin

Canoga Park Wildcat Spuds

Vincent F. Stabeck has spudded No. 2 well on the Knapp ranch near Canoga Park, where Dry Gulch Oil Co. tested a water well at 200 ft. obtained three barrels of oil a day. The new test is located in Sec. 4-1n-17w.

Dominguez Try Reaches Depth

Near the Dominguez field, opened up by Union Oil in 1923, the company is drilling Hellman No. 58 in Sec. 27-3s-13w at 11,236 ft. The original discovery was in the Pliocene.

El Segundo Job Redrills

Standard Oil Co., Operator, Six Companies Fee No. 1 in Sec. 2-3s-15w in the El Segundo area is rigging up to redrill. Original depth is 7033 ft., with plug at 6940 ft. No. 3 is drilling at 6734 ft., after running electric log to 6700.

New Wildcat At Beach City

East of the Huntington Beach field proper, Republic Petroleum Co. has staked location for Newland No. 1 in Sec. 12-6s-11w. Work is scheduled to start shortly.

Los Angeles Test Shows Quantity Oil

Cleanout operations are in progress in Richfield Oil's U. P. Unit No. 4 in Sec. 16-2s-12w in the East Los Angeles area. On formation test at 8515-8550 ft., open 1 hour and 5 min., recovery was 2357 ft. of oil and 1035 ft. of salt and mud.

West Newport Test Drilling

Amerada Petroleum Corp. is continuing to drill steadily ahead below 3600 ft. with its Anaheim Sugar No. 73-7 in the West Newport Beach area, Orange County. Elsewhere in the county, Bandini Petroleum Co. is preparing to abandon its Segerstrom No. 1 test in Sec. 34-5s-10w near Fairview.

Chino Test Plugs Back

Cleaned out, plugged to 4130 ft. and circulating with oil comprise a prelude to pumping barefoot for 10 days Grayco Oil Co.'s Mahla No. 1 in Sec. 1-3s-8w in the Chino area of San Bernardino County, before liner is run. Original bottom is 4251 ft.

Whittier Test Digs

Bradford Bishop's Baldwin No. 1 in Sec. 3-2s-11w in the North Whittier area is drilling hard siltstone at 2790 ft. J. Paul Sievers' Atlas No. 2 in Sec. 17-2s-11w is idle at 3455 ft.

East Coyote Wells Working

Richard and David Jones, Fullerton operators, have taken over the seven wells of Ogle, Inc. in the East Coyote field and the Richfield area. They are starting work to recondition Mathis No. 2 and plans to redrill several wells.

Harbor Area Lists Drilling

Sam Bernstein Petroleum Co. is preparing to drill a well in the Long Beach Harbor area near the intersection of Ventura Ave. and Ocean Blvd. It will be a contract job.

San Diego Test Idling

The exploratory venture sponsored by Snell Oil Co. in Sec. 29-11s-4w on the Sonja Henie estate north of Oceanside in San Diego County is reported idle at 2015 ft.

Riverside Try Going

Palomar Petroleum Co.'s Tyrell No. 1 in Sec. 13-8s-1w near Temecula, Riverside County, is drilling ahead at 1437 ft. J. J. Stephens is general manager for the company.

Desert Wildcat Building Derrick

Antelope Valley Development Co. has taken over the Del Sur Oil Co. No. 1 well not far from Palmdale in Sec. 26-7-12. A new derrick is going up, preparatory to moving in equipment to deepen the project from present depth 2670 ft. Willette Oil Co. has let contract to Pacific Drilling Co. for deepening its Virginia Lee No. 1 in the area.

Placentia Try Rigging

Tide Water Associated is building rig for a prospect job in the Placentia area of Los Angeles County.

The try, known as Community No. 12-1, will drill near the intersection of Madison and Bradford Sts., about one mile north of the town.

FOR SALE OR RENT

1-Emsco Type G-450 Drilling Unit complete, less drill pipe and tools, powered with 2-LP-600 Cummins Diesel engines, engineered to go 7,000 feet with 4" drill pipe.

1-Emsco Type G-42 Drilling Unit complete, less drill pipe and tools, powered with 2-225-h. p. Climax engines, engineered to go 6,000 feet with 4" drill pipe.

1-Emsco Type G-36 Drilling Unit complete, less drill pipe and tools, powered with 2-D-13000 Caterpillar Diesel engines, engineered to go 4,500 feet with 4" drill pipe.

All of these units are in excellent condition and have 2-power driven mud pumps each. Terms can be arranged.

For terms and prices contact

The Oil Tool Corporation

3075 Cherry Ave. **Long Beach 7, Calif.**

Phone 481-81 **L. A. Phone NEvada 610-24**

Bandini Test Drilling On

C. G. Willis, Butler Comm. No. 1 prospect in Sec. 15-2s-12w in the Bandini area is drilling ahead below 4000 ft.

Loma Verde Test Grades

Shell Oil is grading location and laying water lines for U. S. L. No. 515-29 in Sec. 29-5n-17w in the Loma Verde area, roughly six miles northwest of the Del Valle field and several miles north of Halsey Canyon. The lease of approximately 600 acres is made up largely of Government parcels, along with a few private holdings.

Montebello Well Coring

In the Montebello area, Premier Petroleum Corp. is drilling ahead and spot coring at 5405 ft. with Carla No. 1 in Sec. 8-2s-11w. On formation test of the interval of 5435-5384 ft. water with a trace of oil and gas was recovered.

Del Valle Job Tests

Failing on formation test beween 5875 ft. and bottom at 5946 ft., Standard of California is preparing to retest Boobier No. 1 in Sec. 15-4n-17w in the Del Valle area.

Leffingwell Draws New Try

Another wildcat test is preparing to drill in the Leffingwell area of Los Angeles County. It is Highland Oil Co.'s Esterbrook No. 1 in Sec. 1-3s-11w near Whittier Blvd. and First St. Standard's German Comm. No. 1 in Sec. 11 is spot coring at 5442 ft.

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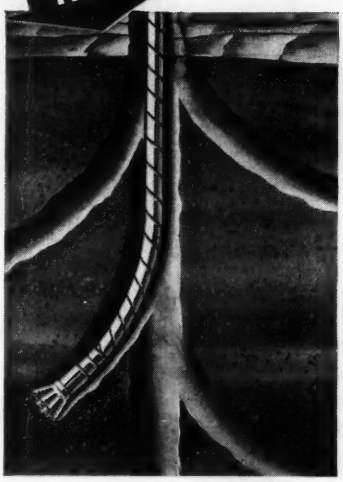

Production of an oil well is, in a sense, an underground transportation problem, involving movement of oil and gas from distant points in the formation to the vertical well, with least amount of turbulence and minimum resistance to flow.

The drilling of horizontal drain tributaries from a vertical bore provides a means of facilitating the movement of oil, as well as guaranteeing an even withdrawal from the entire drainage area of the well.

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HORIZONTAL WELL DRILLING

Coastal and Northern District

Zaca Area Try Starts

Tide Water Associated is building rig for its Quati No. 75, a wildcat test, located 2913 ft. south and 4595 ft. east of the northwest corner of Davis lease in Sec. 34-8n-31w in the Zaca area of Santa Barbara County.

Drill site is approximately four miles north of Los Olivos and a short distance from two pumpers drilled by the company some years ago. These pumpers are producers of extremely heavy crude.

Hub Oil Co., a Los Angeles concern, is among those who have wildcatted in the area near Los Olivos.

Santa Maria Adds Producer

Sunray Oil Corp. has completed Northman No. 4 in Sec. 35-10n-34w in the Santa Maria field at 5641 ft. Initial output was 86 barrels of 18.8 gravity crude oil daily, cutting 45 per cent. Casing has been cemented on bottom at 4952 ft. in the company's Santa Maria Golf & Country Club No. 2 in Sec. 27. The well is being tested.

Cat Canyon Well Comes In

On the Los Flores lease in the Cat Canyon field, Standard of California has completed No. 8 in Sec. 27-9n-33w at 6150 ft. for 225 barrels of oil daily, cutting 48 per cent. Palos Verdes Estates, Inc., P. C. No. 7 in the section is going ahead below 5900 ft. Krieger Oil Co. is grading for Los Flores No. 1.

Bardsdale Job Drilling Ahead

W. H. Geis-Robertson No. 1 in Sec. 12-3n-20e in the Bardsdale field is making progress with the drill below 2800 feet.

Humboldt County Wildcat Testing

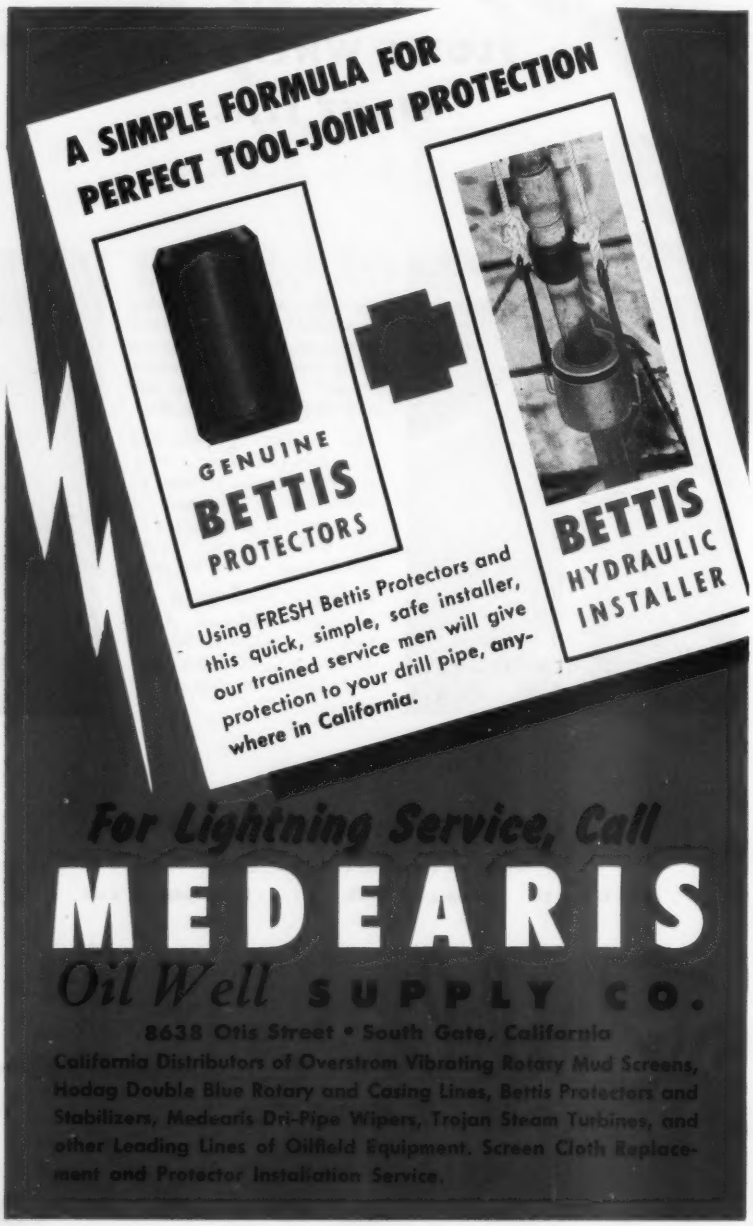
Texas Co.'s Anderson No. 1 in the Hydesville area in Sec. 8-2n-1e, Humboldt County, is testing, after redrilling to 8770 ft. and running 973 ft. of 5-in. liner landed at 8769 ft.

Petrolia Test Resumes Drilling

Operations have been resumed in W. C. M. C. Oil Co.'s Mathew Clark No. 1 in Sec. 21-1s-2w near Petrolia in Humboldt County. The try has been carried to 2020 ft. and 5-in. casing cemented at 1900 ft. The next move probably will be to run liner.

Piru Creek Test In View

On the north flank of the Temescal Anticline near Piru Creek, Bolsa Chica Oil Corp. has staked location for its No. 76-32 in Sec. 32-5n-18w, Ventura County. In the Santa Maria field, the company is preparing to acidize its Wheat No. 4 in Sec. 12 10n-34w. The well is bottomed at 4303 ft. and has 7-in. cemented at 3288 ft.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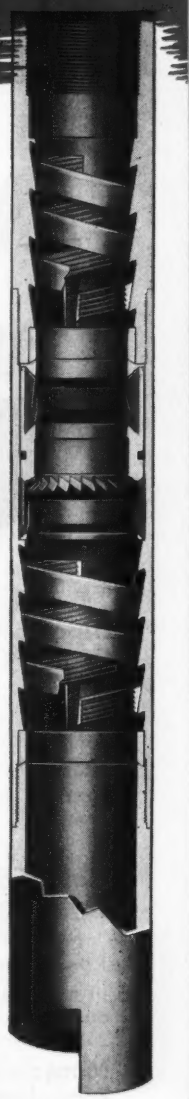
. . . 1) A tool that will catch and pack off drill pipe, coupling or tool joint—whichever is up—*without making changes or adjustments*, and

. . . 2) A tool that can be used with maximum ease and safety under the tight hole conditions often encountered on overshot jobs.



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The Bowen Overshot is available with from one to *four* bowls to meet all conditions encountered—and in sizes for every pipe string. Also made for catching drill pipe, coupling, *or oversize drill collar.* Send for full information, and ask for your copy of a helpful booklet giving operating and maintenance instructions on the Bowen Overshot. There's no obligation at all!

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Consider HI-PERM chemical treatment for all completions. Even those wells that come in "with a bang," produce only through the most permeable sands. The less permeable sands in all wells remain clogged for the life of these wells unless treated. Therefore, to insure minimum damage from high velocity, the whole sand interval should be cleaned with HI-PERM at the very start. Yes sir, for more production, treat when you complete!
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Nipomo Well Grades Ground

Union Oil is grading for its Vernon Wineman No. 1 in Sec. 19-11n-33w in the Nipomo area of San Luis Obispo County. The company controls thousands of acres in the area.

Gato Ridge Try Rigged

Rig is up for Sunray Oil Corp.'s Los Flores No. 1 on prospect ground in the Gato Ridge area in Sec. 4-8n-33w, Santa Barbara County.

Montalvo Wildcat Planning To Test

Having recovered fish and plugged back from 11,505 ft. to 8650 ft. Standard of California is reaming with its McGrath No. 2 in the Montalvo area, preparatory to testing showings.

The well is in Sec. 26-2n-23w on wildcat ground between Oxnard and Ventura. Leasing during recent weeks in the area has been brisk.

King City Try Going

Shell Oil continues to go ahead at 5468 ft. with its Honolulu-Thorup-USL No. 1 in Sec. 4-20s-7e in Thompson Gulch near King City, Monterey County.

Oxnard Try Begins Soon

Near the Oxnard field, discovered by El Rio Oil Co. in 1937, O. L. Riley Co. has staked location for a new wildcat test in the vicinity of Sturgis and Wolff Roads in projected Sec. 5-1n-21w. The try is called Cal Lands No. 1.

San Miguel Area Wildcat In Offing

On an expansive acreage block in the San Miguel area, E. B. Hall & Co. is preparing to start the drill in No. 1 test in Sec. 2-25s-12e, San Luis Obispo County. Hall shares interest in the explorer with Oceanic, Bankline, Barnsdall and Occidental.

West Mountain Lively Center

D. D. Feldman, Operator, Richardson Estate No. 2 in Sec. 23-3n-21w in the West Mountain area of Ventura County is drilling on down at 3908 ft., after cementing casing at 3030 ft. F. E. Fairfield, meantime, is washing perforation in Lemon Co. No. 2 in the section. Total depth is 6744 ft.

Horizontal drilling has been resumed in Los Nietos Co. and Lucy Smith Battson's C. & H. No. 3 in Sec. 23, following completion of a successful fishing job. Total depth is 5181 ft., with plug at 5039 ft.

Richfield Oil has spudded Saticoy No. 1 in Sec. 22 and is making hole at 628 ft. Ring Oil Co., Syd., S. P. No. 1 in Sec. 23 is drilling at 2261 ft. The Oil Tool Corp. has finished No. 1 at a plugged depth of 4045 ft. for an initial yield of 40 barrels of 20 gravity oil a day, cutting 20 per cent. Original bottom is 4505 ft.

Goleta Try Gets Ready

Honolulu Oil is ready to start work on its Honolulu-Signal-Macco No. 1 in Sec. 24-4n-29w in the Goleta area. It is located 1100 ft. westerly of Honolulu-Signal-Goleta Comm. No. 1, spot coring below 3150 ft.

Honolulu has abandoned its Signal-Bates No. 1 in Sec. 36-4n-25w in the Rincon area, after uncovering but little encouragement to 6381 ft.

Fillmore Well May Rig Rotary

After cleaning out to 1435 ft. and bailing mud and water, Jahn's Oil Co., Goodenough No. 1 in Sec. 18-4n-19w in the Fillmore area may rig rotary to carry the project on down. Present depth is 2210 ft.

Elwood Field Well Starting

Signal Oil & Gas Co., which recently completed its State No. 129-12 in the Elwood field, has spudded its 129-S-1 and is drilling No. 208-4 at 4680 ft. The wells are located in Sec. 8-4n-29w, Santa Barbara County.

San Joaquin Valley

Cymric Project Cores Oil Sand

Universal Consolidated is coring ahead at 5490 ft. in the Point of Rocks in its Sauerdough No. 11 in Sec. 23-29s-21e in the Cymric field. The top of the Point of Rocks was in core at 5441 ft.

With the successful completion of the current effort, Universal Consolidated's lease will boast three Point of Rocks producers and two Oceanic oil sand wells. No. 11 found the normal Oceanic zone uphole and as soon as it is given the finishing touches, a twin well aimed at the Oceanic will start.

Independent Exploration Co. has completed its eleventh producer on its Temblor lease in Sec. 17. The well is flowing from 2759 feet in the Carneros at a rate of 325 barrels of 18.6 gravity oil a day through a 16/64-in. bean. Temblor No. 12 is preparing to begin operations.

Texas Company has added two new producers in the area. R. H. Anderson No. Two-34 was finished at 2593 ft. for 150 barrels, and No. Two-46 at 2600 ft. for 218 barrels. Union Oil joined the parade of new producers by bringing on to production its M. & L. No. 8-20 for 219 barrels a day from 2491 ft.

Independent Exploration and Oceanic Oil's combination test, Roco No. 2 in Sec. 18-29s-21e has reached a depth of 1894 ft. in gray sand. Roco No. 1, completed some weeks ago, was credited with a fault block discovery.

McKittrick Try Drilling Ahead

E. A. Parkford is drilling below 4850 ft. with Parkford-McKittrick No. 1 in Sec. 22-30s-22e near the McKittrick field.

Coalinga Test Coring On Down

Sharples Oil Corp., Hyde No. 1 in Sec. 6-19s-16e in the Northeast Coalinga area is coring siltstone at 8147 ft.

Fresno County Discovery Scored

New oil apparently has been found by Superior Oil between Helm and Raisin City in Fresno County.

The find was made by Hakala No. 55 in Sec. 32-15s-17e, which on formation tests of the intervals of 6988-7015 ft. and 7020-7034 ft. showed oil in quantity. Drilled to a total depth of 7171 ft., with 7-in. casing cemented at 7085 ft., the well is in the completion stage.

Acreage holders in the area, in addition to Superior, include Union, Pacific Western and Bolsa Chica.

Round Mountain Discovery Scene

Morton and Kohlbush have completed their Alma No. 1 discovery

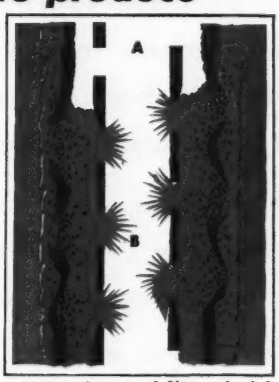
Filter Cake has 2 faces

It's fine when you're drilling . . . but it's the devil and all when you're trying to produce

As you know, one of the reasons for using mud while drilling is to build up a filter cake to protect the formation. Fine! But—if filter cake keeps drilling fluid **out** of the formation, obviously it will hold oil **in** the formation. Not so good, then! (See A.)

That's where a McGaffey-Taylor Pressure Washer comes in. Using the terrific force of **controlled** hydraulic pressure, it drives a powerful jet between close-spaced packers to break up that filter cake and scour the formation clear and clean, to bring in **all** the oil that well will produce. There isn't space here for the full story. To get that,

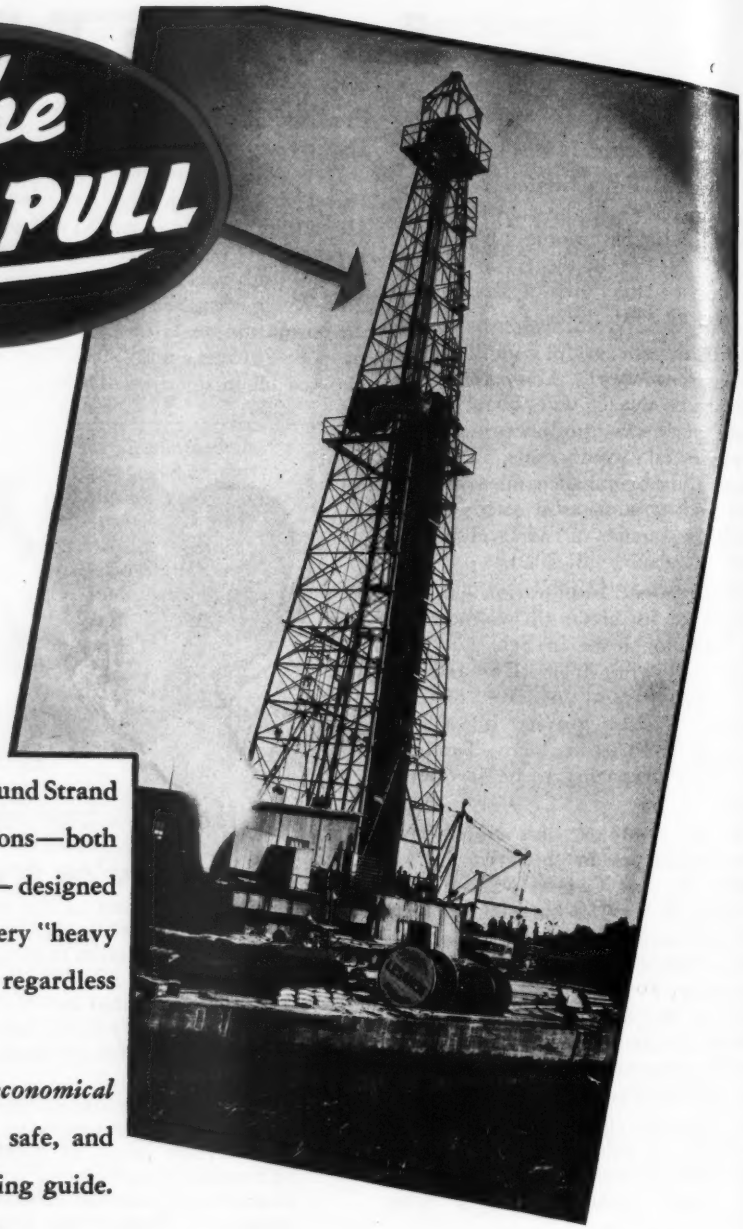
Write for NEW Well Washing Bulletin, or ask a representative to demonstrate transparent model.



A further danger of filter cake left in the well is shown at B. Oil breaking through a few weak spots in the filter cake travels at relatively high velocity, carrying excessive sand. Perforations are being cut away, the sand body is caving: eventually this pipe will collapse.

McGaffey-Taylor
CORPORATION
WELL-WASHING SERVICE
3852 CHERRY AVENUE, LONG BEACH 7, CALIFORNIA
PIERCE ROAD, BAKERSFIELD, CALIFORNIA

For the LONG PULL



. . . for the hard pull. . . for the continuous pull —that's where "HERCULES" (Red-Strand) Wire Rope proves its outstanding stamina!

Yes, here is a truly *tough* rope in Round Strand and Flattened Strand constructions—both Preformed and Non-Preformed — designed and fabricated to correctly meet every "heavy duty" Wire Rope requirement . . . regardless of clime, place or condition.

So, when your next job calls for *economical* service, over a 'long pull'— play safe, and let the Red-Strand be your buying guide.

Your inquiries are always welcome.

"HERCULES"

REG. U.S. PAT. OFF.

RED-STRAND

WIRE ROPE

MADE ONLY BY

A. LESCHEN & SONS ROPE CO.

ESTABLISHED 1857

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NEW YORK • CHICAGO • DENVER • SAN FRANCISCO • PORTLAND • SEATTLE

WAX -

FINE IN CANDLES
A HEADACHE IN OIL LINES

Nobs Wax Solvent will dissolve and remove the most persistent waxes and paraffines from wells lines and traps.

NOBS DEHYDRATING CORPORATION

2465 East 53rd Street, Los Angeles 11, California

well in Sec. 15-28s-28e in the Round Mountain area.

The well was put on the pump for a yield of 170 barrels of 11.9 gravity oil a day from 2746 ft.

Morton and Kohlbush have about 80 acres around the well. Independent Exploration is the holder of more than 200 acres adjacent.

Bender Oil Operations, meanwhile, is ready to begin preliminary work for its No. 1, a wildcat in Sec. 29-30s-29e. Union Oil is grading for its Olcese No. 1 in Sec. 22-28s-29e.

Antelope Plains Explorer Drills

British-American Oil Prod. Co. is drilling at 1648 ft. with U. S. Government No. 66-20 in the Antelope Plains area in Sec. 2-27s-19e, Kern County.

Oil Producer Wins New Fame

Idling through a department store a few days before Easter, a prominent Los Angeles producer spied a flowery hat, which he had the temerity to purchase for his wife as a Springtime gift.

His wife, surprisingly enough, was not only pleased with her husband's choice of hats, but broadcast her husband's shopping prowess to neighbors.

Shortly thereafter, the oil producer was the recipient of a letter, reading as follows:

"Ye Olde Tyme Shopping Service, Ltd.,
Los Angeles, California.

Dear Sir: It has recently come to my attention that you have founded a splendid new super shopping service for fastidious housewives. I certainly want to congratulate you on this modern move which is entirely in keeping with the new age in which we live. This streamline service which you now offer is just the answer to this poor old maiden's prayer.

"For your information I am a wealthy old maid, who has been in bed with arthritis for the past 20 years, and, therefore I am unable to attend to my own personal shopping. I will gladly pay you your regular fee, plus a bonus, if you will select and purchase the following items for my account. I shall leave the selection entirely in your most capable hands. Naturally, I will not quibble over prices and will expect you to choose nothing but quality merchandise. The following items are the most urgent at this time.

"1 Girdle—6-way stretch. Color, black with a sprinkling of wild Irish rose petals around the bottom and, speaking of bottom, reminds me of my size, which is 86.

"1 Bra—Size ample for two large Arizona grapefruits. Color—black with imported Cecil Brunner rose bud decorations.

"If these items are as satisfactory as I am sure your selections will be, I plan to send you an order next month for a garter belt and a dozen pairs of panties. Later in the spring, of course, I will want you to select an assortment of hats for late spring and summer wear.

"Thanking you for your early attention to this order, I remain, Affectionately yours."

The immediate effect of the letter on the producer was to swear off shopping now and for evermore.

SMITH - EMERY CO.
Since 1904
Oils Tested
Shipments Certified
Tanks Strapped
Offices and Laboratories
920 Santee St., Los Angeles — **651 Howard St., San Francisco**

FOR SALE

Two 125 h. p. 250# working pressure Broderick boilers Herley-Kelly, 3201 Pasadena Ave., Long Beach 7, Calif. Phone Long Beach 425-23. tf

FOR SALE—TANK FARM

2 acre tank farm, 4 miles from Long Beach, with 9 tanks; total capacity 14,750 bbls.; has 2 truck loading racks and loading rack on Southern Pacific spur. Price $13,000. Dutch Bandringa, Broker, 741 Compton Blvd., Clearwater, telephone MEtcalf 3-2910. tf

SITUATION WANTED

Accountant, licensed P. A., executive experience, systems, management and purchase control. Know field detail. Local references. Box 100 c/o California Oil World, Los Angeles. 3/20d

FOR SALE

Heavy Core Drilling or Water Well Drilling outfit. Outfit is completely unitized and built on a semi-trailer. 60 ft. quick lift mast; double drum hoist powered with dual Mercury engines; rotary table; hose blocks; hook; swivel; 650 feet 4½" full hole drill pipe; 6" x 30' drill collar; tongs; 1 Ford V-8 tractor; 1 Ford V-8 flat rack truck; 1 Ford V-8 truck with 20 barrel water tank; many accessories. Priced right for a quick sale. Call MIchigan 3613 or write Camay Drilling Company, Box 391, Compton, California.

FOR SALE

One used 7¼ x 14 EN-EXN Gardner Denver Power Pump; 1 used Model PA-100 International Power Unit; 1 used 8" Wigle Spring Hook with Safety Latch. Call MIchigan 3613 or write Camay Drilling Company, Box 391, Compton, California.

U. S. DEPARTMENT OF THE INTERIOR, Bureau of Land Management, Washington 25, D. C. Notice is hereby given that sealed bids will be received until 1 P.M., Wednesday, April 2, 1947, for SW¼SW¼ sec. 22, T. 11 N., R. 20 W., S.B.M., 80 acres, situated within the known geologic structure of the Wheeler Ridge Field, California. This land is offered to qualified bidders of the highest cash amount per acre as a bonus for the privilege of leasing the land under section 17 of the leasing act of February 25, 1920 (41 Stat. 437, 30 U.S.C. sec. 181) as amended. Royalties payable to the United States will be at the rate of 12½ per cent to 25 per cent for oil and 12½ per cent to 16⅔ per cent for gas, in accordance with Schedule B in the lease form Each bidder must submit with the bid one-fifth of the amount bid in cash, or by certified check on a solvent bank, or by money order, made payable to the order of the Treasurer of the United States, and file the showing of qualifications to receive a lease, required under 43 CFR 192.42 (b) and (c). The envelopes should be plainly marked, "Bid for lease, Wheeler Ridge field, California. Not to be opened before 1 P.M., April 2, 1947." No bids received after the hour fixed herein for submitting bids will be considered. The remainder of the bonus and the annual rental at the rate of $1 per acre must be paid and a corporate surety bond in the sum of at least double the amount of rental, but in no case less than $1,000 nor more than $5,000 must be furnished by a successful bidder prior to the issuance of a lease. The deposits of the other bidders will be returned upon acceptance of the successful bids. The successful bidder will be required to agree not to discriminate against any employee or applicant for employment because of race, creed, color, or national origin, and to require an identical provision to be included in all subcontracts. Bidders are warned against violation of section 59, U. S. Criminal Code, approved March 4, 1909, prohibiting unlawful combination or intimidation of bidders. The right is reserved to reject any and all bids. Fred W. Johnson, Director 3-20b

California Oil World's Monthly Summary

DEVELOPMENT—PRODUCTION—SUPPLY & DEMAND
PACIFIC COAST TERRITORY

TABLE I—CALIFORNIA DEVELOPMENT—PRODUCTION

	JANUARY, 1947 DEVELOPMENT				PRODUCTION	
	Active Drilling Wells	Oil Wells Completed	Initial Production B/D	Oil Wells Completed First Month	Daily Average January 1947	Daily Average January 1946
SAN JOAQUIN VALLEY REGION						
Ant Hill	.....	1	96	1	1,591	1,212
Bellevue	.....	.....	.....	.....	300	458
Belridge—North	.....	.....	.....	.....	5,335	5,632
Belridge—South	2	3	57	3	9,901	10,933
Blackwell's Corner	.....	.....	.....	.....	205	223
Buena Vista Hills	1	3	156	3	48,157	40,266
Canal	.....	.....	.....	.....	1,990	2,831
Coalinga Group						
Eastside	1	.....	.....	.....	16,016	17,927
Oil City	.....	.....	.....	.....	107	82
Coalinga—Nose	.....	.....	.....	.....	52,500	44,836
Coalinga—Northeast	1	.....	.....	.....	7,523	7,861
Pleasant Valley	1	.....	.....	.....	3,627	3,738
Jacalitos	2	1	712	1	4,265	4,370
Westside	1	1	18	1	6,637	6,928
Coles Levee—North	2	.....	.....	.....	16,336	15,146
Coles Levee—South	1	.....	.....	.....	2,343	1,934
Edison	5	4	648	4	12,526	11,973
Elk Hills	6	1	10	1	8,018	14,613
Fruitvale	.....	.....	.....	.....	7,166	7,790
Greeley	.....	.....	.....	.....	10,049	10,974
Helm	.....	1	209	1	4,216	4,687
Kern Front	3	3	197	3	8,527	8,826
Kern River	2	3	60	3	9,281	9,422
Kettleman North Dome	5	1	306	1	37,391	39,245
Lanare	2	.....	.....	.....	2,498	1,594
Lost Hills	5	2	77	2	4,014	3,523
McKittrick Group						
Cymric	4	6	685	6	12,192	3,827
McKittrick	.....	.....	.....	.....	2,850	3,099
McKittrick Front	.....	.....	.....	.....	1,591	1,425
Phacoides	.....	.....	.....	.....	.....	.....
Salt Creek	3	3	478	3	3,210	12
Sheep Springs	.....	.....	.....	.....	399	482
Temblor Ranch	.....	.....	.....	.....	114	15
Midway-Sunset	4	2	353	2	42,472	39,874
Mount Poso Group	.....	.....	.....	.....	15,289	17,167
Mountain View	3	4	344	4	4,563	2,778
Paloma	11	2	2,200	2	7,428	4,578
Poso Creek Group	1	2	260	2	3,448	3,515
Pyramid Hills	.....	.....	.....	.....	271	324
Race Track Hill	1	.....	.....	.....	2,142	1,025
Raisin City	.....	.....	.....	.....	2,692	2,521
Rio Bravo	.....	.....	.....	.....	13,115	13,410
Riverdale	.....	.....	.....	.....	4,014	3,122
Rosedale Ranch	.....	.....	.....	.....	120	124
Round Mountain Group	.....	1	129	1	9,036	9,820
Strand	.....	.....	.....	.....	1,424	1,835
Strand—East	.....	.....	.....	.....	463	576
Tejon Ranch	3	2	299	2	2,464	624
Ten Section	1	.....	.....	.....	7,822	8,378
Union Avenue	.....	.....	.....	.....	343	174
Wasco	.....	.....	.....	.....	467	841
Wheeler Ridge	.....	.....	.....	.....	226	235
Williams	.....	.....	.....	.....	1,435	1,695
Other Fields	2	1	102	1	186	304
TOTAL—San Joaquin Valley Region	73	47	7,396	47	420,295	398,795
COASTAL REGION						
Santa Maria District						
Casmalia	.....	.....	.....	.....	231	36
Cat Canyon—East	.....	.....	.....	.....	.....	383
Cat Canyon—West	5	2	776	2	8,552	7,333
Gato Ridge	2	.....	.....	.....	3,653	4,116
Lompoc	3	6	1,224	6	2,807	1,258
Orcutt	3	4	451	4	4,132	3,607
Santa Maria Valley	6	2	265	2	29,852	33,918
Zaca Creek	.....	.....	.....	.....	395	316
Santa Barbara District						
Capitan	.....	.....	.....	.....	3,209	3,377
Elwood	1	1	249	1	7,084	6,161
Santa Barbara	.....	.....	.....	.....	69	94
Summerland	.....	.....	.....	.....	2	.....

	JANUARY, 1947 DEVELOPMENT				PRODUCTION	
	Active Drilling Wells	Oil Wells Completed	Initial Production B/D	Oil Wells Completed First Month	Daily Average January 1947	Daily Average January 1946
COASTAL REGION—Continued						
Ventura District						
Padre Canyon	3	.....	.....	.....	2,632	2,730
Rincon	.....	.....	.....	.....	4,169	4,860
San Miguelito	2	.....	.....	.....	5,157	4,867
Ventura Avenue	9	4	2,427	4	45,375	46,783
North Santa Clara District						
Del Valle	6	1	161	1	7,263	6,201
Hopper Canyon	1	.....	.....	.....	233	94
Oak Canyon	.....	.....	.....	.....	1,707	1,968
Sespe Canyon Group	.....	.....	.....	.....	286	222
Temescal	.....	.....	.....	.....	569	679
Others	.....	.....	.....	.....	226	220
South Santa Clara Valley District						
Aliso Canyon	2	.....	.....	.....	3,041	2,984
Bardsdale	.....	.....	.....	.....	420	500
Newhall-Potrero	2	.....	.....	.....	5,863	5,575
Oxnard	.....	.....	.....	.....	776	1,095
Shiells Canyon	.....	.....	.....	.....	1,057	1,488
South Mountain	3	1	66	1	4,480	3,018
Others	2	2	235	2	826	296
San Luis Obispo and Santa Clara Counties	.....	.....	.....	.....	30	75
TOTAL—Coastal Region	50	23	5,854	23	144,096	144,254
LOS ANGELES REGION						
Brea-Olinda	3	5	622	5	11,424	10,399
Coyote—East	1	4	491	4	4,731	4,781
Coyote—West	3	2	384	2	14,839	15,518
Dominguez	3	2	390	2	15,183	17,202
East Los Angeles	1	1	907	1	779	.....
El Segundo	.....	.....	.....	.....	538	597
Huntington Beach	6	5	1,035	5	47,964	47,401
Inglewood	1	.....	.....	.....	12,225	13,525
Long Beach	.....	.....	.....	.....	23,825	25,692
Montebello	.....	1	10	1	7,698	9,203
Newport	10	11	2,680	11	7,819	2,648
Playa Del Rey	.....	.....	.....	.....	2,277	2,238
Potrero	.....	.....	.....	.....	679	1,056
Richfield	2	3	93	3	6,726	7,181
Rosecrans-Athens Group	.....	.....	.....	.....	4,822	5,347
Santa Fe Springs	.....	.....	.....	.....	16,150	16,773
Seal Beach	3	.....	.....	.....	10,694	9,347
Torrance	.....	.....	.....	.....	8,529	8,757
Whittier	.....	.....	.....	.....	1,009	1,017
Wilmington	15	16	11,376	16	120,318	94,856
Yorba Linda	.....	.....	.....	.....	195	266
Other Fields	.....	.....	.....	.....	1,334	961
TOTAL—Los Angeles Region	48	50	17,988	50	319,758	294,765
EXPLORATORY						
Outpost Wells	32	.....	.....	.....	.....	.....
Wildcats	16	.....	.....	.....	.....	.....
Gas Wells	5	6	Gas	6	.....	.....
TOTAL CALIFORNIA	224	126	31,238	155*	884,149	837,814

*—Includes gas wells completed and 29 drilling wells abandoned.

TABLE II—SUPPLY AND DEMAND FOR PETROLEUM PRODUCTS PACIFIC COAST TERRITORY
DATA FOR JANUARY OF EACH YEAR

	January 1942	January 1943	January 1944	January 1945	January 1946	January 1947
RAW MATERIAL—B/D						
1. Crude Oil Produced—California	628,621	764,075	812,794	892,511	838,766	884,149
2. Crude Oil from outside 5 Western States	2,766	3,150	4,818	8,005	3,008	4,077
3. Natural Gasoline Produced	36,000	35,000	38,000	41,000	40,000	41,000
SUPPLY OF FINISHED PRODUCTS						
ALL SOURCES—B/D						
4. Natural Gas., L.P.G. and Condensate	15,484	18,645	10,160	18,097	25,065	23,516
5. Gasoline and Naphtha Distillates	210,774	235,419	307,225	335,032	272,580	301,742
6. Kerosene and Kerosene Distillates	2,774	8,742	10,064	5,419	11,484	11,387
7. Lubricating Oils, etc.	9,258	10,161	13,548	11,355	12,387	15,032
8. Gas Oil and Diesel Oil	58,194	77,258	80,226	76,465	108,129	141,580
9. Fuel Oil Residuum	244,355	389,065	463,646	471,967	412,968	384,484
10. Asphalt and Road Oils	14,936	20,193	15,742	20,484	12,420	18,613
11. Coke and Other Finished Products	3,258	1,580	420	3,161	2,548	6,742
12. Other Unfinished Oils	(2,387)	(3,903)	(226)	(5,710)	(5,419)	(1,000)
13. Refinery Storage and Gas	19,098	29,195	35,388	46,452	30,129	(31,226)
14. Crude Oil (Net)	103,000	29,710	(53,227)	4,484	30,968	32,419
15. TOTAL SUPPLY	678,744	816,065	882,966	987,386	913,259	965,741
16. TOTAL DEMAND	670,454	748,486	992,839	1,065,743	916,999	1,034,741
17. DIFFERENCE	8,290	67,597	(109,873)	(78,357)	(3,740)	(69,000)
18. Stocks on hand End of each month (Total Bbls.)	141,824,000	132,059,000	96,854,000	86,439,000	74,600,000	88,248,000

With **THIS RIG** *I'm the best dern driller in the country*

A good driller is one who can do an outstanding job in the shortest possible time . . . you can bet that he's using a Wilson! Here is a rig that will deliver steady and dependable power. A trouble-free rig that will not cut your profits with frequent costly breakdowns. It's no wonder that Wilson is always first choice with top-flight drillers.

Our production assembly line is going full blast. Now is the time to place your order for Your Wilson, *the Pioneer of Power Rigs that is still setting the pace.*

H & B SALES CO. **2875 CHERRY AVE., LONG BEACH 6, CALIFORNIA**

PACIFIC COAST REPRSENTATIVE FOR WILSON RIGS AND WINCHES

With Drilling Contractors

Two sons of the "auld sod," Jerry O'Brien and George McCarthy, Los Angeles drilling contractors and geologists, celebrated St. Patrick's Day with the successful completion of Lyter No. 1, an interesting discovery well in Payne County, Okla.

The project was drilled for the combined interests of Jergins Oil Co., Long Beach, and Aladdin Petroleum Corp., Wichita, Kan. Location is in the center of 800-acre lease block. The acreage was assembled after a detailed sub-surface geological study.

Brad Mills, executive vice president of the American Association of Oilwell Drilling Contractors, recently cited the oil industry's increasing tendency toward contract drilling.

He pointed out that many large oil producing organizations have stepped up their contract operations in areas where their own tools formerly accounted for most of the development.

"Certainly," he remarked, "the gradual increase in the percentage of wells drilled under contract offers the driller contractor a broader field of operations and an increased obligation to do a better job.

"A sober look at the petroleum industry as a whole places it in at least an 'average' position, while actually the pent-up demand for oil products of every kind points to an increased consumption that will lift us to greater activity in every branch. It is conceivable that new discovery methods and improved drilling operations will give us a type of development not now anticipated."

The average number of rigs operated last year was not far short of the all-time record, Mills stated. The number of wells completed in the United States was from six to eight per cent above those completed in 1945. Discoveries were not sensational and the 1946 drilling brought about nothing that should reduce operations during the current year.

Drilling & Production Co. has the contract for drilling E. B. Hall's wildcat near San Miguel in San Luis Obispo County.

Contract has been let to San Joaquin Drlg. Co. to deepen Consolidated Oil Co.'s Derby No. 2 in the Mountin View field.

Vincent F. Stabeck's test on the Frank Knapp Ranch near Canoga Park is drilling ahead under the expert guidance of Jess C. Barnes Core Hole Drilling Co.

Gene Reid Drilling Co. chalked up another success in the Cymric area with Independent Exploration and Oceanic Oil's discovery well on the Roco lease. Gene also scored a discovery at about the same time with Morton & Kohlbush's Round Mountan venture, Alma No. 1.

Other current Reid drilling jobs include Pacific Oil & Gas Dev. Corp.'s C.C.M.O. in the Jasmine area and several at Cymric.

Independent Exploration and Bandini Petroleum Co.'s important wildcat test in the Pleito area near Wheeler Ridge is a Clyde Hall Drilling Co. job.

Rushing and Roberts, recently organized, is drilling Richfield Oil Corp.'s Saticoy No. 1 test in the West Mountain area.

C.C.M.O. Co. has awarded contract to George Terry Drilling Co. for drilling its scheduled job in the Grapevine-Tejon area.

Tracy Harkness, contractor, has carried Seaboard Oil Co.'s Garrison-Davis No. 1-5 in the Magunden area to 7500 ft. and is continuing to make hole steadily ahead.

The California chapter of the American Association of Oilwell Drilling Contractors held one of its most enthusiastic meetings at the Bakersfield Inn at Bakersfield.

The chief point of discussion centered on the subject of whether or not the 1947 national convention of the association should be held in California. The meeting drew a large attendance.

California drilling contractors joined with members of other branches of the oil industry in expressing gratification of the crude oil price boost.

An upward revision of crude prices in the state was expected ever since the Mid-Continent and other areas placed higher posting in effect. Nevertheless, formal action on prices by the major purchasers was a factor of encouragement to a large segment of the drilling and producing branches of the industry.

New drilling should increase, particularly in the wildcat category, with resultant benefit to contract drilling organizations.

The A.A.O.D.C. in cooperation with the U. S. Bureau of Mines' safety division has started work on production of a film depicting floor operations in making a round trip.

The film as planned when completed will show operations as performed on at least six rigs of various sizes and where crews use a variety of work practices.

Particular attention will be given in the film to cathead, tongs and spinning lines operations. A portion of the movie will be filmed in color to demonstrate a safety color code being developed for petroleum industry by the Pittsburgh Plate Glass Co. and the E. I. DuPont de Nemours Company.

Personalities IN THE NEWS

Baker Named Manager at Neilsen Pump

The retirement of Karl P. Neilsen, founder of the Neilsen Pump Company at Long Beach, Calif., and promotion of R. K. Baker to manager of the organization have been announced.

Mr. Neilsen started the Neilsen Company as a repair shop in 1924. It became the Neilsen Pump Division of the Oil Well Supply Company,subsidiary of the United States Steel Corporation, on August 1, 1945. Mr. Neilsen remained with the organization as Division Manager until his retirement. Mr. Baker has been associated with Mr. Neilsen in various capacities almost from the beginning of the Neilsen Pump Company in 1924.

E. E. Stevenson, Chief Engineer, and S. P. Glasgow, Sales Manager, continue in these capacities, Mr. Glasgow with added responsibilities in the supervision of stores.

From the small beginning at Long Beach a thoroughly modern manufacturing plant and field service organization has been developed. Today the Neilsen Pump Division of "Oilwell" has special sub-surface pump field stores in all the principal oil fields of California—the latest at Coalinga. Through the distribution facilities of the Oil Well Supply Company's world-wide organization, a marketing program for Neilsen Sub-Surface Pumps is now projected throughout the United States and in all foreign oil fields.

Basil Kantzer, chief production engineer for Union Oil, was a principal speaker at the regular March meeting of the Santa Maria Oil and Gas Association at Santa Maria. He discussed California oil consumption, production and reserves. Before moving to Los Angeles, Kantzer was a Santa Maria resident and production engineer and foreman in that district for Union.

Bowen Celebrates 25th Anniversary 1921-1946

At an Anniversary Dinner held recently the company celebrated the organization's founding at Huntington Beach by S. R. Bowen in 1921 by presenting employees with pins for five, ten, twenty and twenty-five years service. Special recognition was given to J. A. Wilcox, President, S. Siracusa, Treasurer and A. G. Baumbach, as these men have been with the company since its inception in 1921.

J. A. Wilcox

From Huntington Beach the company branched out to Long Beach, Santa Fe Springs, (where the new manufacturing plant with greatly expanded facilities is nearing completion), Bakersfield, Ventura, Avenal, Santa Maria, and Casper, Wyoming. Foreign Offices are maintained at 30 Rockefeller Plaza, New York City.

The name Bowen covers both S. R. Bowen Company and Bowen Fishing Tool Company—both California corporations. The S. R. Bowen Company manufactures the tools which are used in every oil producing country in the world, and The Bowen Fishing Tool Company covers the servicing of the tools to the oil industry in the United States.

J. R. (Bill) Pemberton, geologist, engineer and former California oil empire, has been elected a director of General Exploration Co.

K. T. McCamman, Shell Oil, spoke on "Range of Sucker-Rod Pumping" and John E. Sherbourne, Union Oil, talked on "Mechanics of Waterflooding" at the meeting of the American Petroleum Institute in Shell Recreation Hall, Signal Hill.

A recent San Francisco business visitor was L. L. (Red) Aubert, president and general manager of Bankline Oil Co. Aubert was a leader in the campaign for increased crude oil prices in California.

John Cody, general superintendent for Superior Oil of Calif., is in Oklahoma, where he is supervising efforts to free pipe stuck in the company's world's depth record well in Caddy County. Depth is 17,211 ft.

The recent meeting of the Coalinga-Avenal chapter of the American Petroleum in the Polvadero Country Club was highlighted by a speech by Marion Dice, manager of the economic department of General Petroleum, Los Angeles. His topic was "Ample Fuels for the Future." The meeting was proceeded by a dinner.

Ray Preece, widely known member of the California oil industry, has been appointed field manager of Hancock Oil's drilling and production department. He also is chief geologists for the company.

George F. Prussing, technical secretary for the Western Oil and Gas Association, has returned to his Los Angeles office, after being in attendance at a meeting of the American Petroleum Institute in New York and at a conference of the Flammable Liquids Committee of the National Fire Protection Association, Wilmington, Del.

Announcement on Petroleum Equipment Suppliers Annual Meeting

With the selection of hotel headquarters, the setting of the meeting dates, and the formulation of the plans for the various events to take place, preliminary arrangements have been completed for the Annual Meeting of the Petroleum Equipment Suppliers Association, it has been announced by H. R. Safford, Jr., Executive Secretary.

The meeting will be held at the Mark Hopkins and Fairmont Hotels, in San Francisco, California, on the 4th, 5th, 6th, and 7th of May.

Hugh H. Glen, President of Emsco Derrick and Equipment Co., is the present President of the Petroleum Equipment Suppliers Association, and heads an Arrangements Committee which is composed of California leaders in the Supply and Equipment Industry.

"Our members are spread all over this country", said Mr. Glen, "and we of the Arrangements Committee are determined that the coming meeting shall be of a nature that will justify the long distances many of them will travel to attend the meeting."

"We plan a program of events, both business and social, that we feel will not only be of interest to everyone attending, but will make this meeting a memorable one in the Association's long history," Mr. Glen continued. "Though some of our plans are not yet in shape where we can make a concrete announcement of exactly what they will be, it is felt that before long we will be able to send every member a final program of events."

Aside from the special business meetings planned, the regular business will include the election of new Officers and Directors of the Association, the planning of the future activities, and the discussion of matters of Association finances and policies.

Attendance, from preliminary estimates received from the members, is expected to approximate 300.

Dresser Joins Santa Fe

The Santa Fe Tank and Tower Co., with its main office in Los Angeles, has announced the addition of Harold A. Dresser to its Engineering Staff. Mr. Dresser, formerly of the Fluor Corporation, has taken over the Cooling equipment Division of Santa Fe as part of a sustained program to enlarge its present facilities to cope with an ever-increasing clientele. This latest move represents a significant milestone in the history of Santa Fe, inasmuch as Mr. Dresser is nationally recognized as one of the foremost authorities in the cooling equipment industry.

H. A. Dresser

Dresser, an alumnus of the California Institute of Technology, has been associated with the cooling equipment industry since 1926.

Over this 20 year period, Dresser's background enveloped every phase of cooling towers and equipment. He started with the field construction force, graduating to the Engineering Department where he took an active part in the general development and experimentation of new type towers.

In September, 1946, the Santa Fe Tank and Tower Co. was successful in securing the services of Mr. Dresser to head and expand their ever-increasing Cooling Equipment Division.

For the past 15 years Dresser has been associated with the California Natural Gasoline Association. He has written numerous articles on cooling towers for many engineering publications, and he has associated himself with research specialists in the highly technical field.

George Atha, Los Angeles consulting geologist and oil producer, has been spending considerable time in recent days in New Mexico, where he holds interest in a Chavez County exploration program.

A, S, (Mac) Macomber, a member of Revel-Miller organization and one of the most popular members of the Los Angeles investment business, in his youth was an active driller at Signal Hill, Athens and Torrance. He was associated with Norvell Brawley, his brother-in-law.

Problems of Unitization

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such a representative will take hours to argue or, let me say, discuss, a point that an executive of the company would decide in a matter of minutes. I am sure you know what I am talking about. All this takes time and time is one of our greatest problems. Elk Basin was in labor 18 months before she delivered. Others have taken two to three years. Oklahoma City was in labor for four or five years, resulting only in a miscarriage. Already West Edmond has been the subject of many months of discussion. I dare to assert that if the officers of the different companies involved in the unitization of these various pools had met across the table and faced squarely the problems involved, the time element would become negligible. Time is of the essence. The problem does not rest with the courts. It does not rest with the royalty owner. It rests with the Industry. And may I say in respect of the Industry and give to it a scriptural admonition: "What thou doest, do quickly".

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(1) Univ. of Okla. Press 1930, p 140
(2) API Prdtn Bull. 207, 1931, p 11
(3) Report III, Fed. Oil Cons. Bd. to Pres. of U.S., Feb. 25, 1929
(4) Part 2, Congressional Inv. Comm. Rep. 1934, p 1272
(5) 177 U.S. 170
(6) Brown vs Humble Oil & Refg. Co., 83 S.W. (2) 935
(7) 77 Pacific (2) 83

A.A.P.G. Meeting

(Continued from Page 7)

40 per cent of the total area within the closing contour. Black 18 gravity oil is also produced from the Mississippian Madison limestone. Commercial amounts of gas occur in the Cretaceous Frontier and Cloverly sandstones and the Triassic Chugwater sandstones. Gas is present in commercial quantities both separately and in association with the oil in the Embar limestone. Oregon Basin is one of the more important reserves of black oil in Wyoming.

The Elk Basin Field, Montana, was discussed by W. S. McCabe, Stanolind Oil & Gas Co. The Elk Basin Field is a northwest-southeast trending asymetrical anticline approximately eight miles long and four miles wide, with approximately 5000 feet of closure. It is located in the north end of the Big Horn Basin on the Wyoming-Montana line and is approximately 25 miles east of the Beartooth Mts. The field was dicovered in 1915 by a well completed in the First Frontier Sand (Upper Cretaceous) which produced 50 barrels of oil per day. In 1922 gas was discovered in the Dakota Sandstone (Lower Cretaceous). Tensleep (Pennsylvania) production was discovered in 1942 and 129 wells have been drilled and completed as producers from this formation. The 1946 discovery well in the Madison Formation (Mississippian) was completed flowing about 200 barrels per day.

Society of Economic Paleontologists & Mineralogists

William H. Corey, Continental Oil Co., president of the S.E.P.M. Pacific Coast Section, and his committees, were hosts to the national S.E.P.M. officers and delegates. Two symposiums and a technical session covered the topics of California stratigraphy, applied micropaleontology, and the environmental significance of sedimentary lithology. The symposium on stratigraphy was of particular interest in that it covered the topical analysis of the Los Angeles Basin, Ventura Basin, Santa Maria District, Sacramento Valley, Central Part of the Great Valley and the San Joaquin Valley.

The technical papers discussed the distribution of vertebrate and invertebrate organisms; while the symposium on lithology considered shales, sandstones and conglomerates.

Society of Exploration Geophysicists

J. J. Jakosky, Univ. of Southern Calif., S.E.G. president, and his committees, made the annual meeting of this organization a memorable success. A wide variety of geophysical topics were covered during the three-day session. Of particular interest were those dealing with potentiometric model studies (B. D. Lee. The Texas Co.); and airborne magnetometer operations (R. D. Wyckoff, Gulf Research & Dev. Co.). Of special Pacific Coast interest were the papers dealing with the geophysical histories of the Ten Section Field (J. C. Waterman, Shell Co.); the Raisin City Field (John Sloat, Union Oil Co.); the North Coles Levee field (Joseph Le Conte, Richfield Oil Corp.); and the Canal Oil Field (R. W. Shoemaker, Ohio Oil Co.).

Many other papers of outstanding interest were given. Among these can be mentioned that dealing with two recent improvements in radioactivity prospecting apparatus (M. J. Test, Geophysical Instrument Co.); the velocity analysis of the East Coalinga Nose Area (G. J. Long, Standard Oil Co.); preparing reports on geophysical prospecting (E. J. Stulken, Geophysical Service, Inc.); and the application of radar to offshore surveying (J. W. Miller, Stanolind Oil & Gas Co.).

Pleito Wildcat Ready to Spud

Independent Exploration and Bandini Petroleum are ready to spud an interesting new wildcat in the Pleito area, southwest of the Wheeler Ridge field in the Pleito area.

The project, known as KCL-A No. 11-10, will drill on Sec. 10-10n-20w. More than 12,000 acres have been blocked up surrounding the test.

New CNGA Chapter Announced

The formation of a second California Natural Gasoline Association Chapter has been announced by CNGA president M. W. Kibre. It will be known as the Coastal Chapter and will meet on the third Wednesday of each month at Ventura. C. L. Case, Continental Oil Company, is Chairman and G. C. Elmore, Tide Water Associated Oil Company, Secretary.

The new chapter held its first meeting on Wednesday evening, February 19, in the Southern Counties Gas Company auditorium, with 85 men in attendance. Speaker of the evening was F. W. Hertel, Ventura Superintendent for Tide Water Associated Oil Company, whose subject was "The History of the Ventura Avenue Oil Field." Following the talk a colored motion picture, "Drilling Operations in The Swamps of Southern Louisiana," was presented by Fritz Huntsinger of the Ventura Tool Company.

Present to wish the new Chapter success were Chairman George Howells and H. V. Cowger of the Taft Chapter; and CNGA vice-president Frank Colton, secretary-treasurer George Tyler, membership chairman David Conklin, and director C. L. Hutchings, all of the parent organization, Los Angeles.

Earlimart Job Still Testing

Superior Oil's Day No. 24-22 in Sec. 22-23s-26e in the Earlimart area of Tulare County is testing, after running 185 ft. of 7-in. stub liner and cementing at 4171 ft. Total depth is 4173 ft.

The venture appears to have made an interesting discovery on the west side of a surmised fault.

Miramonte Try Fishing

Having made inside cuts at 16,315, 12,317 and 12,282 ft., without successfully pulling drill pipe stuck in National Royalties No. 1 in Sec. 5-26s-22e in the Miramonte area, Pacific Western is running magnotector.

Trico Try Spudded In

LeBow and McNee have spudded Bolz No. 1 in Sec. 19-24s-23e in the Trico area in Tulare County.